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ABSTRACT

Award winning designs for dual-use fallout shelters are presented, representing contributions by the design professions toward development of the national defense resource. The focus and concept of the competition is described as the basis for judging. The nature of dual-use shelter is discussed, which contributes to understanding of the techniques for controlling exposure to gamma radiation from fallout. Graphic illustrations are given of award winning dual-use shelter space in community structures appropriate to residential areas. (FS)

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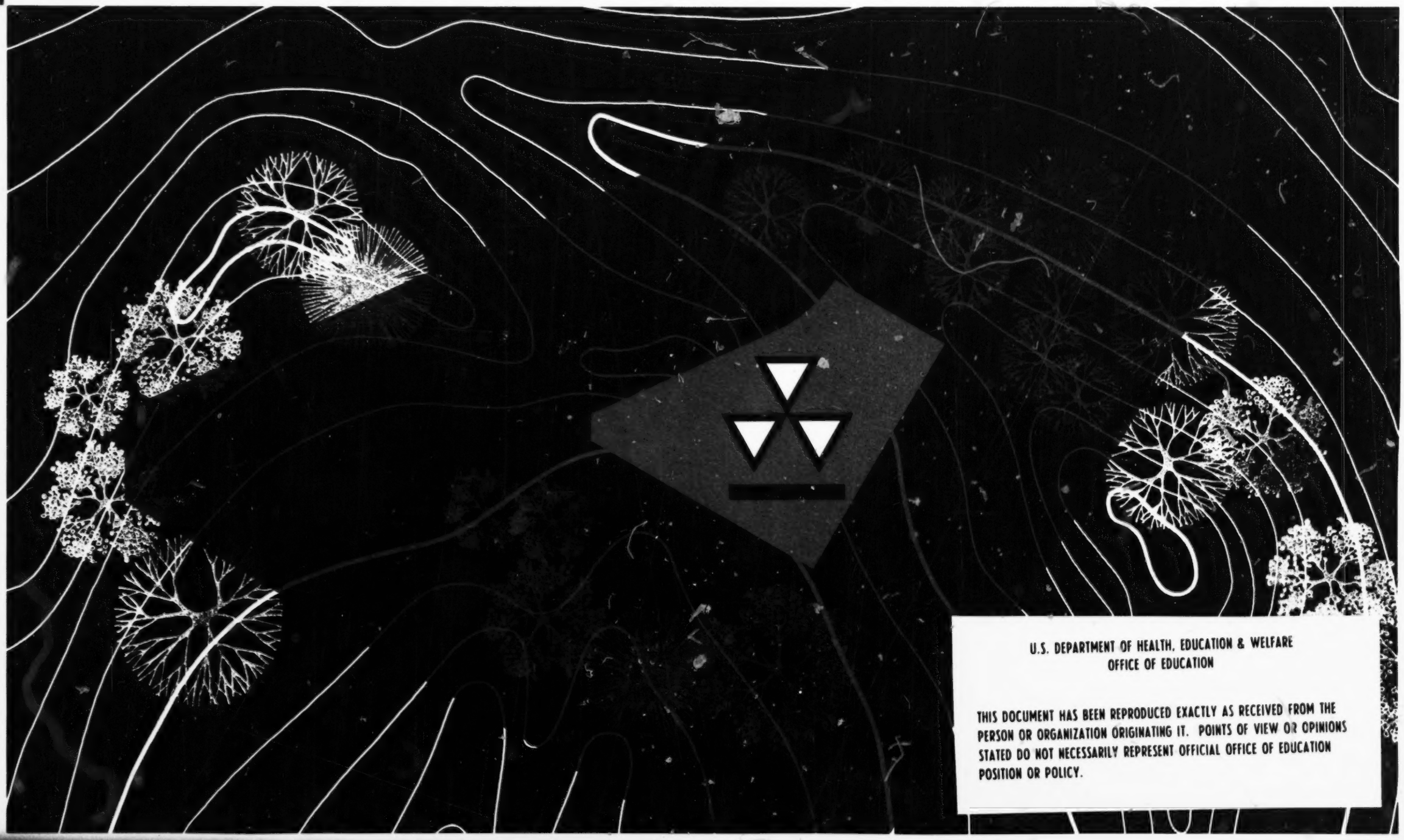
NATIONAL FALLOUT SHELTER DESIGN COMPETITION ■ COMMUNITY CENTER

awards



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NATIONAL
FALLOUT SHELTER
DESIGN COMPETITION

COMMUNITY CENTER

awards

PREFACE

The award winning designs presented in this booklet represent another major contribution by the design professions, through the medium of an architectural competition, toward fuller development of the national defense resource obtainable by the inclusion of dual-use fallout shelter in new construction.

Two previous competitions have focused on schools and shopping centers. The latest competition in this series, completed in 1966, gave attention to a community recreational and educational center. The National Fallout Shelter Design Competition-Community Center and the previous competitions were conducted by The American Institute of Architects at the request of the Office of Civil Defense and have been administered by the Institute as a public service under nonprofit contracts with the Department of Defense.

The results of this latest competition provide graphic illustration of the nature of dual-use shelter and should contribute added understanding of the techniques for controlling exposure to gamma radiation from fallout. It is hoped the award-winning designs will stimulate improvements in the design of community educational and recreational centers and assist in the creation of effective facilities for civil defense.

A. Stanley McGaughan, FAIA
Professional Adviser
Washington, D.C.
May 12, 1967

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STATEMENT OF THE DEPARTMENT OF DEFENSE

The winning entries in the National Fallout Shelter Design Competition-Community Center, shown in this brochure, are the results of a continuing effort of the Office of Civil Defense begun in 1962. That year, an architectural design competition was held, the subject of which was a fallout protected school. It was followed two years later by a shopping center competition.

Once again it has been demonstrated that, through the genius of the architect with a team comprising the building owner, the consulting engineers, and the fallout shelter analyst, simple techniques can be applied to solving another community problem. That problem is to provide dual-use radiation protection in buildings for the Nation's population (in the event of nuclear attack) that is unobtrusive, functional and economical.

With an annual rate of applicable construction expenditure of $25 billion, the potential source for completing our national shelter system lies in new buildings. It is the task of the design professionals to develop this potential to the maximum.

The winning teams are congratulated on their excellent designs. They have made an invaluable contribution to the national defense by setting examples for all to follow.

Joseph Romm
Acting Director of Civil Defense

Mr. Romm

STATEMENT BY
THE AMERICAN INSTITUTE
OF ARCHITECTS

This is the third architectural competition conducted through the cooperation of The American Institute of Architects and the Office of Civil Defense. The Institute has been gratified with the results, which indicate the interest of the design professions in solving the problems of shelter against fallout radiation and their skill in producing outstanding designs which incorporate shelter provisions in several types of buildings which occur in most communities.

This competition for a community center produced fourteen prize winning designs which showed an imaginative treatment of the planning of a community education and recreational center in good scale and character for suburban communities where such centers may be built.

As a member of the jury for this competition, I enjoyed the privilege of taking part in the selection of the winning designs and am pleased to extend my compliments to the winners and to the Office of Civil Defense for its service to the profession and the public in making the competition possible.

Charles M. Nes, Jr., FAIA
President
The American Institute of Architects

Mr. Nes

REPORT OF THE PROFESSIONAL ADVISER

Focus and Concept:

The goal of the national civil defense program continues to be the provision of an effective fallout shelter system with space available to every man, woman and child whenever and wherever needed. The program for identifying, marking and stocking of shelters in existing buildings has each year added a significant shelter resource. However, this shelter is located principally in the heart of metropolitan communities—in centers of government or business activities where large buildings provide inherent shielding through the cumulative weight of the construction materials surrounding the interior spaces. Thus, the business or daytime population may be provided with a surplus of shelter in most large cities, while protection is available to only a portion of the family (at home) population or the nighttime residential population.

The attention of this competition, as of two previous competitions, focuses on the encouragement of the creation of dual-use shelter space in community structures appropriate to residential areas.

The concept of dual-use space has been continuously stressed but still warrants special comment. By dual-use space we mean a building or space within a building designed to fulfill an essential long-range peacetime function but adaptable to use as fallout shelter during emergency periods. The architectural implications inherent in this concept are obvious. The building or space must be designed with full attention to its primary long-range function, and it must completely satisfy all functional and aesthetic requirements or it is not good architecture. A less stringent quality standard may be applied in evaluating shelter design which is related to emergency use for a limited period of time. The primary objective is to provide effective and economical life-saving protective shelter. Conditions of austerity and inconvenience can be tolerated when the first consideration is to achieve human survival.

This quality standard for shelter design does not relieve the architect of an obligation to solve the problems of shelter management and to create the most attractive and efficient shelter consistent with basic project objectives. Rather, he must give additional study, particularly during the preliminary design phase of his work, if needed fallout shelter is to be provided without serious economic waste and sacrifice in architectural quality.

Special Aspects of the Competition Program:

The objective and scope of the competition were given initial definition by a Department of Defense statement incorporated in the competition program. The shelter design criteria for the competition were those recommended by the Department of Defense as design standards for radiation protection and shelter occupancy. The complete program is reprinted at the end of this booklet for reference use.

Schools and shopping centers provided easily defined subjects for the previous competitions in this series. The selection of the subject for this third competition was not quite so easy, and the definition of the function and scope of a hypothetical community center presented many problems.

The title "community center" identifies no standard concept or architectural type evolving from our culture. It applies to a variety of places ranging from a New England village green to such new cultural complexes as Lincoln Center in New York. It is clear that new "centers" of all types are receiving public attention and support in all parts of the country, in existing urban areas and in new towns.

A primary purpose of this competition was to encourage the development of a variety of new concepts with the widest possible application to both small and large projects. It was, therefore, decided that the "center" as defined by the competition program would include cultural and educational as well as recreational facilities, and that each competitor would be given considerable latitude to fashion a project best suited to a typical community in his region of the country. Thus, the center was defined as having a gross floor area of 75,000 square feet to 135,000 square feet, and a library and certain educational and recreational features were specific program requirements. However, the size and character of an auditorium and the inclusion of such major recreational facilities as a gymnasium, swimming pool and outdoor athletic fields were left to the discretion of the designer.

It was recognized that, while the larger and more comprehensive centers offer the greatest possibility for a variety of solutions to the design of dual-use space, relatively few communities can afford the initial capital outlay for such extensive community facilities. To provide a more realistic program, it was required that the total facility be designed to permit "its construction in two or more increments as availability of municipal budgets may dictate."

Experience in this and previous competitions in this series indicates that flexible program requirements bring forth the desired variety of solutions without creating undue difficulties for the Jury.

Collaborative participation by architects, engineers and fallout shelter analysts working as design teams was a program requirement.

Representatives of the Department of Defense and The American Institute of Architects gave advice and assistance in the preparation of the program, which was reviewed and approved by the Department of Defense and the Institute's Committee on Architectural Competitions.

The Judging:

The Jury for the competition was carefully selected to include outstanding representatives of both the architectural and engineering professions. No attempt was made to select jurors who by their practice had demonstrated knowledge of shelter design. Design judgment and professional maturity were the qualifying criteria.

The Jury was instructed to evaluate submissions and to make its primary decisions on the basis of architectural quality. Conformance to the detailed shelter design criteria stipulated in the program was checked by a skilled team of shelter analysts, thus freeing the Jury to consider the broader aspects of the designs.

The analysts selected from the qualified instructors who have presented the OCD Fallout Shelter Analysis Course to Architects and Engineers at schools throughout the country included the following:

Carl J. Childers, Jr., AIA
Associate Professor
Department of Architecture and Allied Arts
Texas Technological College, Lubbock, Texas

James McNeil (Commander)
CECOS, Construction Battalion Center
Port Hueneme, California

William H. Erwin (Lt.)
Protective Construction Section
Construction Engineering Branch
DE&MS, USAES, Fort Belvoir, Virginia

James J. Abernethy (Lt.)
Protective Construction Section
Construction Engineering Branch
DE&MS, USAES, Fort Belvoir, Virginia

Morris Beckman, AIA
McGaughan & Johnson, Architects
Washington, D. C.

The Jury first made an initial or tentative selection of winning designs for each OCD region. These selected designs were then handed to the analysis group for a careful check of conformance to the shelter design criteria. Final judgment by the Jury was then made with knowledge of the protection adequacy and the shelter capacity for each design under consideration.

Edgardo Contini, P.E., of Victor Gruen Associates of Beverly Hills, California, who had been appointed as a member of the Jury, was unable to serve. James Roembke, P.E., Deputy Assistant Director of Civil Defense for Technical Services was, therefore, appointed to replace Mr. Contini on the Jury. Robert Berne, AIA, Chief Architect of the Office of Civil Defense and project director acted as technical advisor to the Jury.

The Jury met at The American Institute of Architects Headquarters in Washington, D. C., on the morning of May 25, 1966 and completed the judging on the evening of May 27, 1966. Public announcement of the awards was made on June 17, 1966.

Results of the Competition:

The winning designs presented in this booklet provide additional illustration of the variety of solutions available in the design of dual-use fallout shelter. Such shelter is shown to be achievable with economy and without sacrifice of functional, aesthetic or other human values. Several designers have shown that sensitive manipulation of space can not only provide a protective resource but contribute added delight to the human environment. Shelter is shown as sometimes below grade, sometimes above grade, fully enclosed or provided with natural light and ventilation as the designer's handling of geometric and barrier shielding dictates. It need be neither expensive, ugly, restrictive nor psychologically confining. Shelter design is shown as essentially an architectural art, a new problem in environmental design.

A careful study of the winning designs included in this booklet, as well as those selected in the two previous competitions, is recommended to all architects. A knowledge of the nature of such protective design will enable the architect to maximize the potential for dual-use space in connection with almost any building project. The value of considering dual-use shelter space during the development of the basic design concept for any project will be easily seen.

There are now more than 12,000 qualified shelter analysts in all parts of the country ready to serve the architect who does not have analysts within his own organization. Further, the Office of Civil Defense offers an advisory service through numerous University centers administered by architectural and engineering schools.

The Report of the Jury provides general evaluation of the successful designs plus specific comments on each selected entry. The discussion of Basic Terminology of Radiation Shielding was prepared by Morris Beckman, AIA. The Statement entitled Shelter Evaluation preceding the Jury Report was prepared by Carl J. Childers, Jr., AIA. Mr. Childers also served as Chairman of the team of shelter analysts during the period of the competition judgment.

The specific comments by the Jury, and the Analysts are presented with each design.

A. Stanley McGaughan, FAIA
McGaughan & Johnson, Architects
Washington, D.C.

Mr. McGaughan

BASIC TERMINOLOGY OF RADIATION SHIELDING

The terms used in this booklet referring to protective control from fallout gamma radiation are defined briefly as follows:

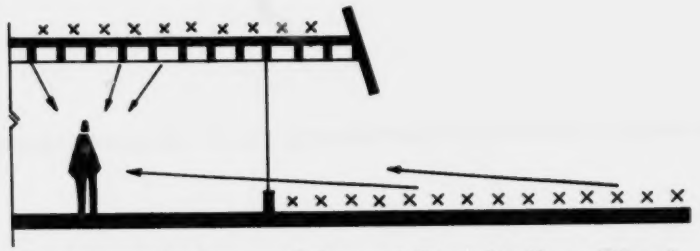
Protection Factor (PF) expresses the relation between the amount of gamma radiation that would be received by an unprotected person compared to the amount that would be received by one in a shelter. For example, an occupant of a shelter with a PF of 40 would be exposed to a dose rate 1/40 (or 2½%) of the rate to which he would be exposed if his location were unprotected.

Gamma radiation reaches an individual in an enclosure from several sources: the *roof contribution* refers to radiation originating from radioactive particles (dust and debris) which may accumulate on an overhead source plane; the *ground contribution* refers to all similar radiation from fallout originating from the ground source plane. The *ground contribution* is further subdivided into *ground direct, wall scatter, ceiling shine* and *skyshine.*

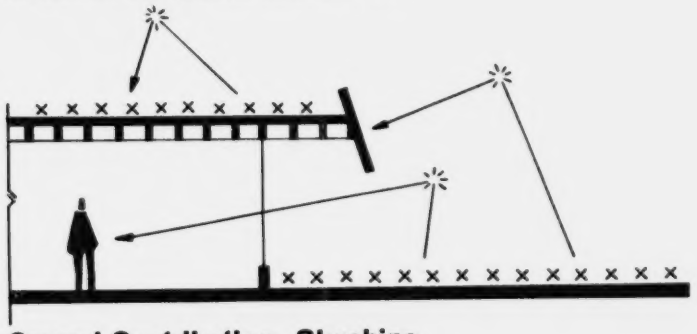
Shelters with high protection factors are achieved by the planning and control of geometric and barrier relationships between the radioactive source and sheltered enclosure. *Geometric shielding* places people out of the direct path of radiation or at some distance from it. *Barrier shielding* places mass between the shelter occupant and the radioactive source.

The section on this and the facing page illustrating the application of these shielding principles is directly related to the building configuration demonstrated in the Grand Prize Design.

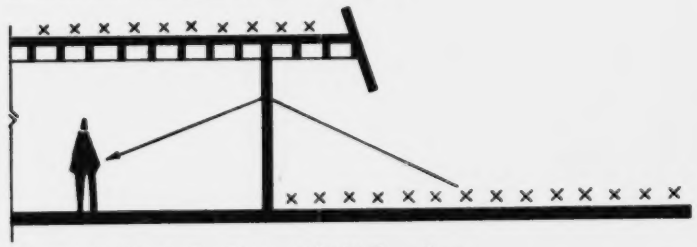
RADIATION TYPES AND SOURCES



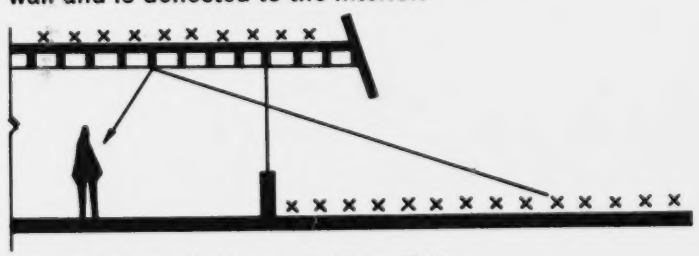
Roof Contribution and Ground Contribution—Direct
Most radiation will come directly from fallout on the ground and the roof.



Ground Contribution—Skyshine
Some radiation is scattered by molecular interaction with particles in the air.



Ground Contribution—Wall Scatter
Some radiation interacts with particles in the wall and is deflected to the interior.

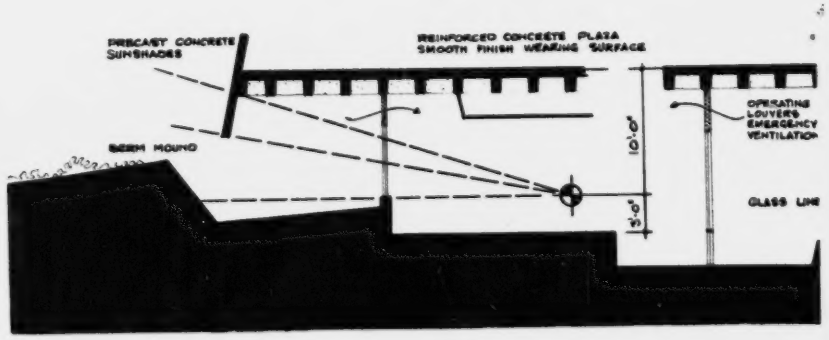


Ground Contribution—Ceiling Shine
Some radiation interacts with particles in the ceiling or other horizontal plane and is deflected.

TECHNIQUES FOR EXPOSURE CONTROL

In section below the weight of the concrete overhead construction provides *barrier shielding* reducing radiation from the *roof contribution*, while the concrete sunshades provide *barrier shielding* against *skyshine* and the *ground contribution* from the berm mound. The berm and the sloping grade at the left of the section limit the source area for *ground direct* radiation and place the direct path of radiation above the shelter occupants (geometric shielding) while the earth provides inexpensive *barrier shielding* eliminating most of the ground direct radiation at the occupants level. The retaining wall and higher surface grade at the right act similarly to limit the source area, place the direct path of radiation at some distance above the occupants as well as providing *barrier shielding*. The mass of the additional buildings at the right provides effective mutual *barrier shielding*. The earth slopes within the central court combine with a system of concrete and masonry planters, garden walls and benches to provide both *barrier* and *geometric shielding.*

The use of glass walls eliminates radiation from *wall scatter*. *Ceiling shine* is controlled by limiting the source plane and by the distance factor.



SHELTER EVALUATION

Carl J. Childers, Jr., AIA
Associate Professor
Department of Architecture and Allied Arts
Texas Technological College, Lubbock, Texas

The award-winning solutions of this competition have demonstrated the concept of fallout shelter as dual-use space. All winning entrants were very successful in incorporating shelter as the secondary function of dual-use space without detracting from the primary function of the space. This dual-use concept is the key to providing shelter in any building at little or no additional cost. Some competitors have indicated how the shelter space could be organized for emergency operations. Quiet zones for sleeping, activity zones for work and recreation, cooking and eating areas utilizing existing furniture and equipment, operations center for the manager, and medical care areas were suggested. Emergency supplies of water from swimming pools, reflecting pools and fountains were frequently provided thus solving one of the most critical problems of shelter habitation.

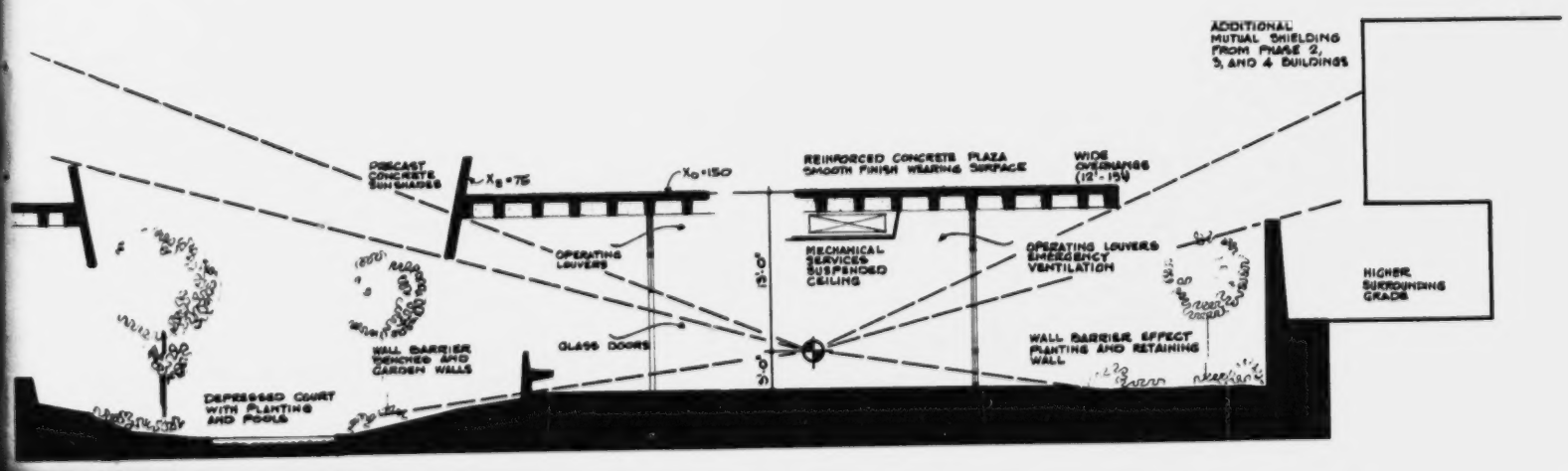
The achievement of an established protection factor (PF) depends on the combined use of geometry and barrier shielding. It was evident that many designers considered shielding in the early design stage, taking advantage of low-cost geometry shielding and then using barriers only to the extent required. Geometric factors that were used effectively included increasing the distance from the shelter to the planes of contamination (especially the overhead plane); limiting the contaminated ground plane by the use of topography or another building (mutual shielding) and reducing the ground direct contribution by either lowering the structure into the ground or sloping the ground away from the building.

Many designers realized that fallout shelter is more economically accomplished in some types of spaces than in others. Long span structures above ground might not be as adaptable as short span structures because of the difficulties involved in supporting the additional mass weight required for shielding. Each floor of multi-story construction may be utilized as a barrier to radiation. This is especially effective if the ground direct contribution is eliminated or reduced. Some designs took advantage of this, and excellent protection was accomplished with no additional cost.

Other solutions indicated wholly or partially below ground shelters. The barrier then required was primarily overhead. The use of glass at the shelter level in these cases opened the shelter to the outside. The limiting of ground direct contribution was achieved by the use of design techniques including such features as wide overhangs, terraces, platforms, retaining walls, landscaping and topography.

Some solutions indicated "washdown" as a decontamination procedure for removal of overhead contribution. Although it is recognized that decontamination by washdown can reduce the contribution, research studies at this point indicate that it is a complex and expensive means of obtaining an unknown result. The systems require extensive piping and disposal. The effectiveness of roof washdown is primarily dependent on water flow and the slope and composition of the roof surface. Surfaces such as tar and gravel, corrugated material and tiles cannot be fully washed, and other problems would be encountered where freezing weather occurs. The Office of Civil Defense does not consider the effects of washdown in establishing the protection factor. It is suggested that other methods may be more economical and reliable.

Shelter spaces ranging from completely below ground to entirely above ground were encountered in this competition. Each condition illustrated properly protected shelter and space that was well utilized. An understanding of geometry and barrier shielding and the imaginative use of shielding techniques resulted in shelters of merit in terms of primary function, shelter habitability and economy.



REPORT OF THE JURY

Preamble

The subject selected for this competition was a Community Center. As in the first two competitions, the objective as stated by the Department of Defense was: ". . . . to demonstrate that fallout shelters can be included as dual-use space in all building types at little or no added construction cost and without adversely affecting function or appearance. In selecting a community educational and recreational center as the subject, the OCD was mindful of the goals of other national programs. Many of these emphasize education for both youth and adults, retraining for increased economic opportunity, recreation and physical fitness, and the development of needed community facilities and improvement to total environment."

The program requirements were modest and highly flexible, leaving to the competitors a wide choice of types and sizes of facilities to be provided. This latter factor, although adding to the task of judging entries, contributed to an increased variety of submissions.

Much of what has been said in Jury Reports of the previous competitions can be repeated here. The general level of competence was high although some regional awards were withheld. In most entries the integration of shelter as dual-use space was achieved unobtrusively and without adversely affecting either funtion or appearance. This was achieved masterfully in the premiated submissions.

Walter B. Sanders, FAIA
Chairman

Mr. Curtis

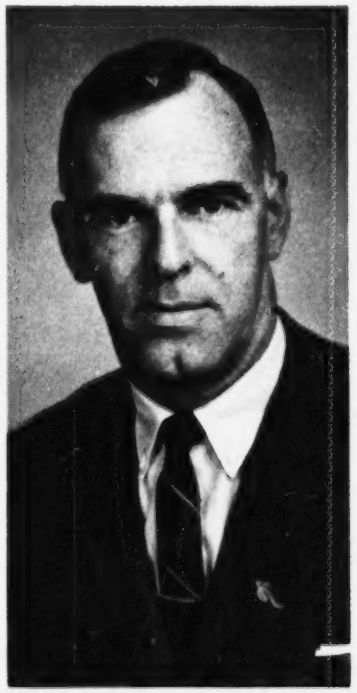
Mr. Cywin

Mr. Ketchum

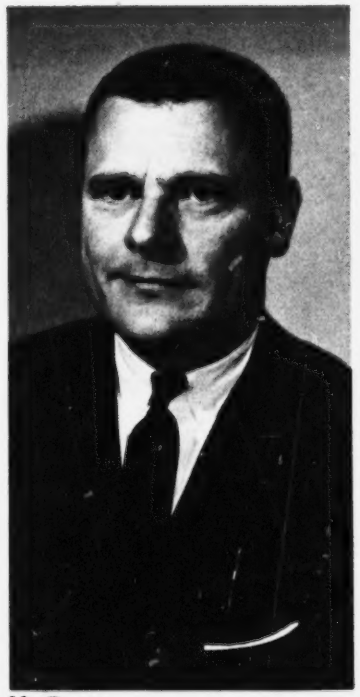
Mr. Nes

Mr. Roembke

Mr. Sanders



Mr. Satterlee



Mr. Berne

THE JURY

Nathaniel C. Curtis, FAIA
Curtis & Davis, Architects
New Orleans, Louisiana

Allen Cywin, P.E.
Assistant Commissioner for
Operations and Engineering
Community Facilities Administration, HHFA
Department of Housing and Urban Development

Milo S. Ketchum, P.E.
Ketchum, Konkel, Ryan & Fleming
Old Saybrook, Connecticut

Charles M. Nes, Jr., FAIA
Fisher, Nes, Campbell & Associates
Baltimore, Maryland
President, The American Institute of Architects

James E. Roembke, P.E.
Deputy Assistant Director of Civil Defense
for Technical Services
Department of Defense,
Washington, D.C.

Walter B. Sanders, FAIA
Professor of Architecture
University of Michigan, Ann Arbor, Michigan
President, Association of
Collegiate Schools of Architecture

Nicholas Satterlee, FAIA
Nicholas Satterlee & Associates, Architects
Washington, D.C.

Technical Adviser to the Jury
Robert Berne, AIA
Chief Architect, Office of Civil Defense
Department of Defense
Washington, D.C.

the awards

GRAND PRIZE

Brooks and Brooks, AIA, *Architects*
Houston, Texas

Team Members
David George Brooks, *Architect*
Edward Brooks, *Architect*
Luis Gonzales Balanza
John J. Dasek, *Architect and Fallout Shelter Analyst*
Ernest L. Vogt, Jr., *Engineer, P.E.*

Jury Comment

The center designed by the winning team includes a library, gymnasium and civic auditorium as its principal elements, along with a variety of classrooms, studios, shops, meeting rooms, lounges and game rooms. Public and service access to the center is well handled, as is parking and the development of exterior courts and playfields. Phasing of construction—a program requirement—is realistic and allows for completion of the complex in four stages.

Principal elements are grouped around a multipurpose unit with a depressed central court and are well related to the plaza formed by the roof deck of the central element. The gymnasium and auditorium are well conceived and functionally sound, but questions were raised by the Jury relative to the control and circulation aspects of the library. Wide concrete roof projections with deep concrete fascias provide shielding from both sun and radiation. This feature, plus sensitive site grading and the use of low walls, pools, and other landscape elements, results in shelter spaces that are essentially open. The structure and materials of construction are well suited to their purpose, and in no way is architectural quality compromised by the demands of shelter.

Analyst Comment

This solution has provided fallout protection in the first construction phase of the complex in the administrative and meeting areas. To accomplish shelter at ground level, use was made of landscaping, retaining walls, berms, and a recessed court to lessen ground direct contribution. The space functions as an open, informal atmosphere which lends itself to excellent shelter habitability. The psychological advantage of openness is achieved very naturally, through judicious use of shielding techniques.

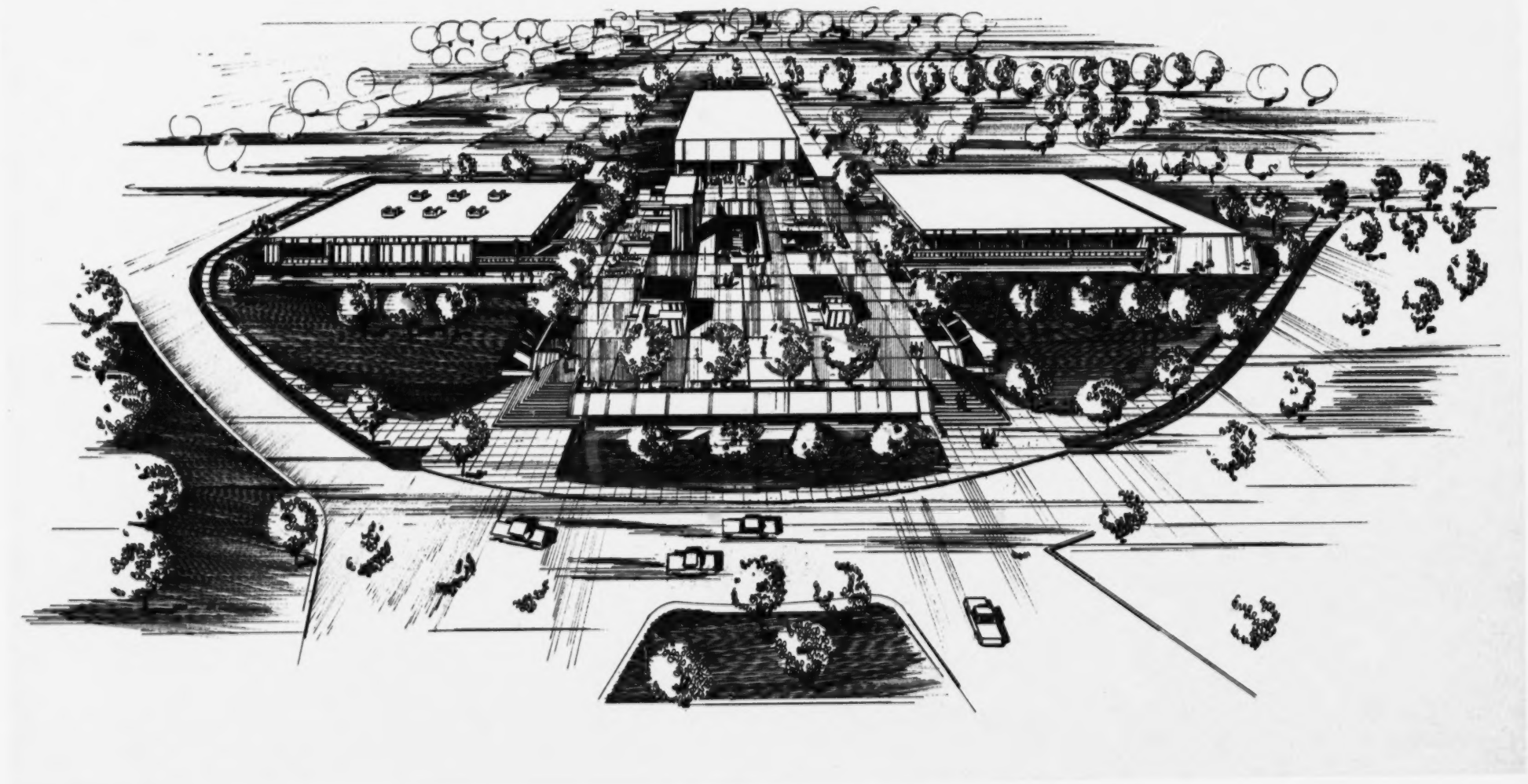
Large concrete overhangs provide protection from sun and skyshine contribution. Simple devices are provided under these overhangs for natural ventilation.

Some modification to the other phases could raise the shelter capacity without excessive costs. As the other phases are completed, the PF of the first phase will be increased because of mutual shielding provided by the other structures.

The mass required for the plaza above was effectively utilized for mass shielding.

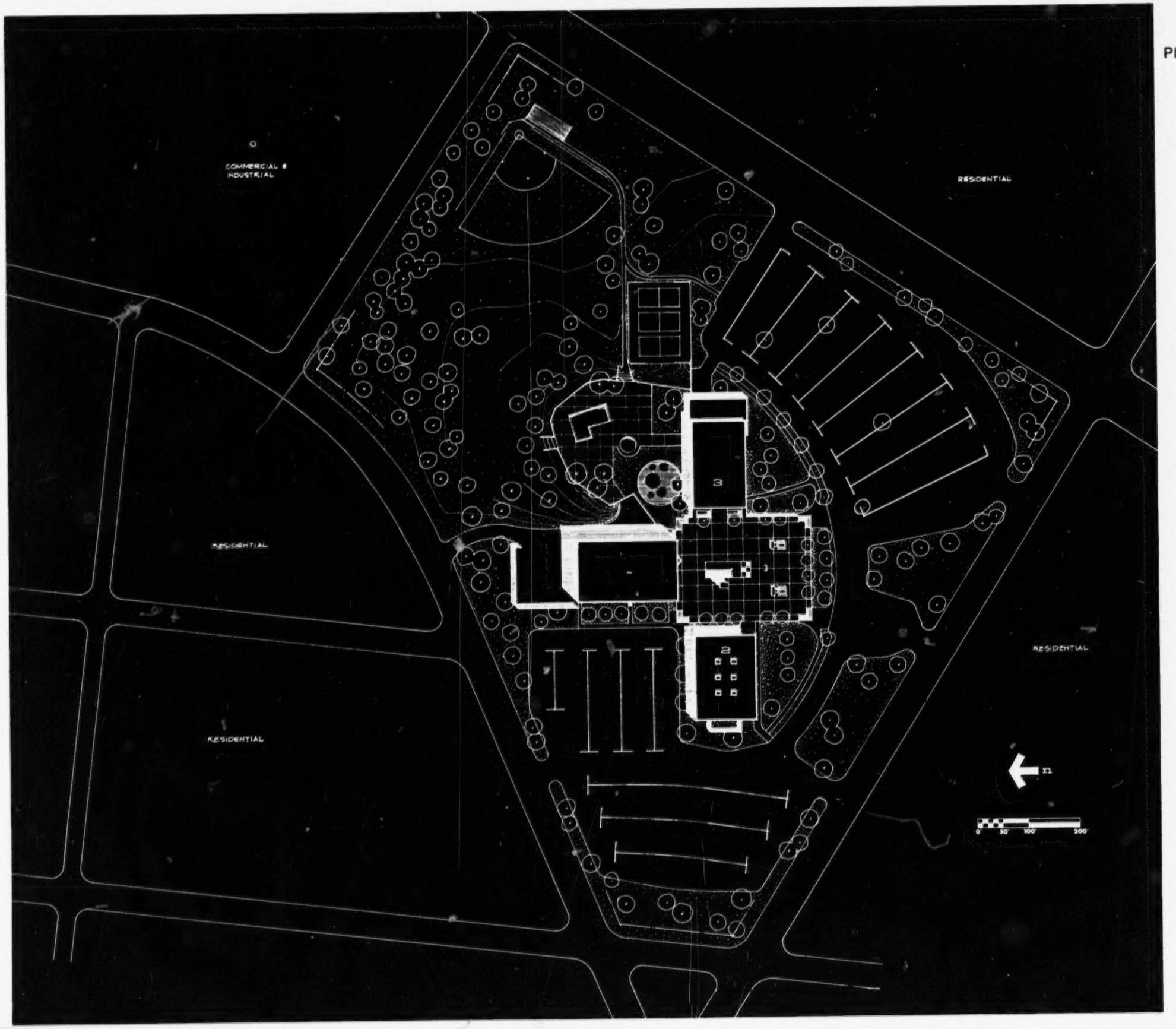
The design presents an imaginative use of shielding techniques to accomplish fallout shelter as a dual-use space.

Courtyard Perspective



Exterior Perspective

Plot Plan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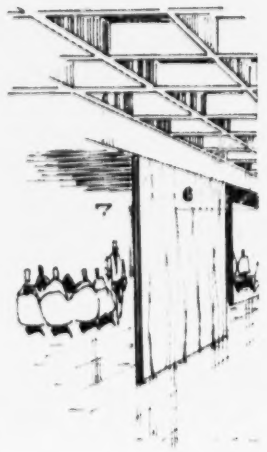
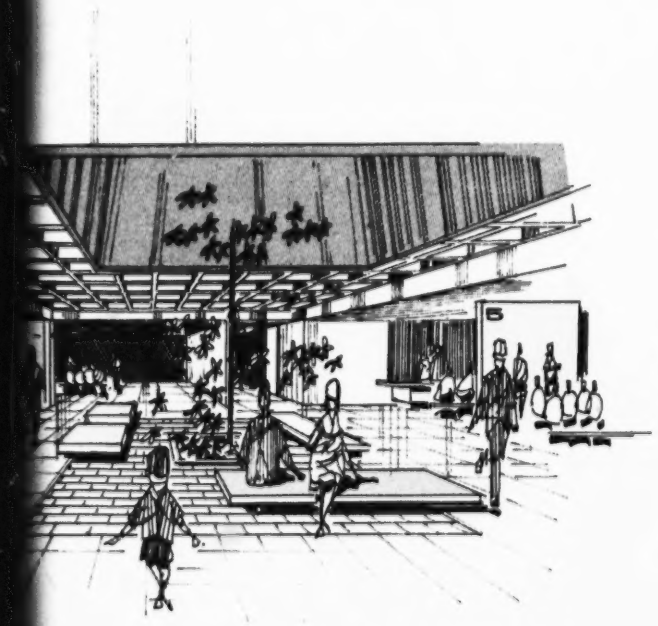
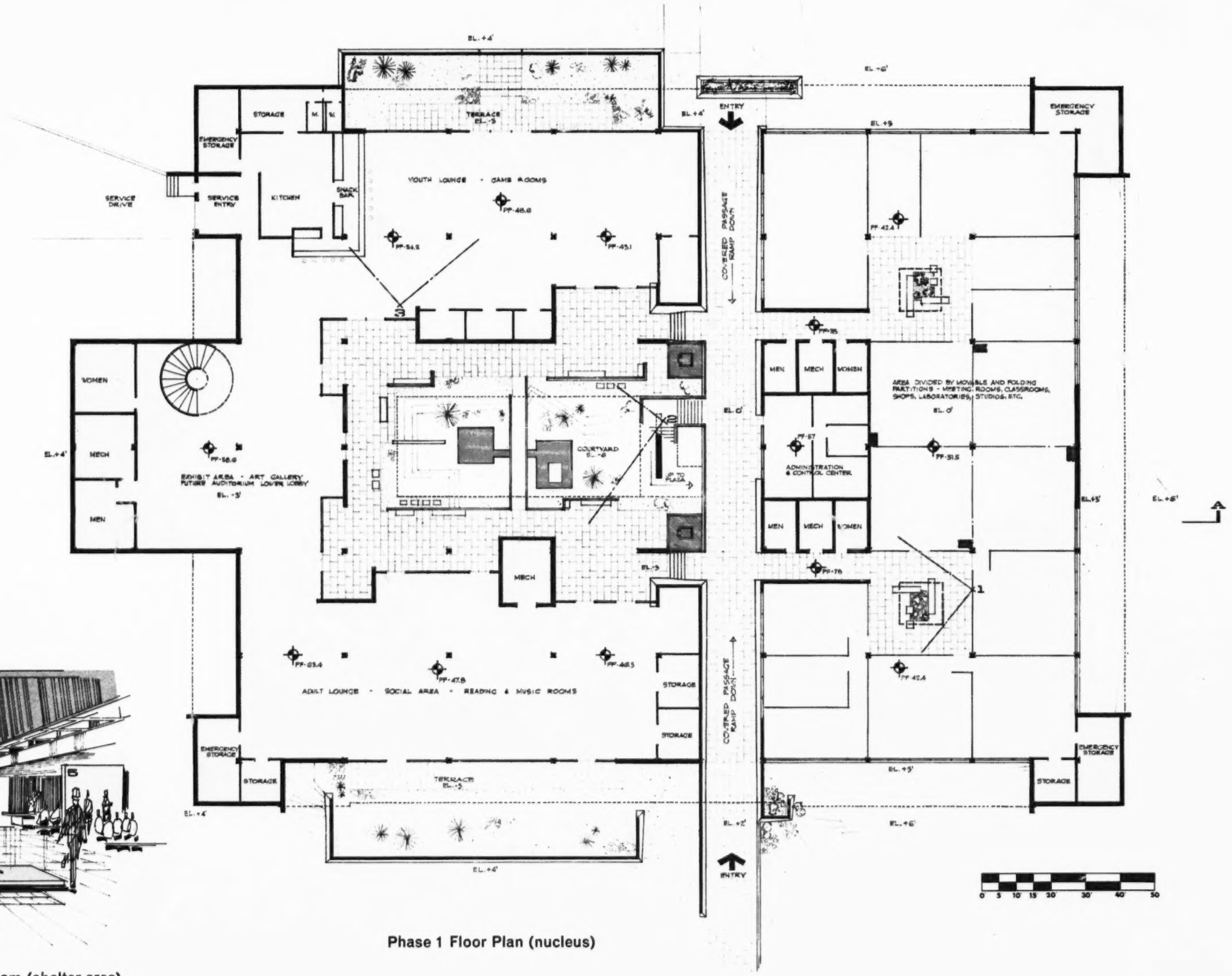




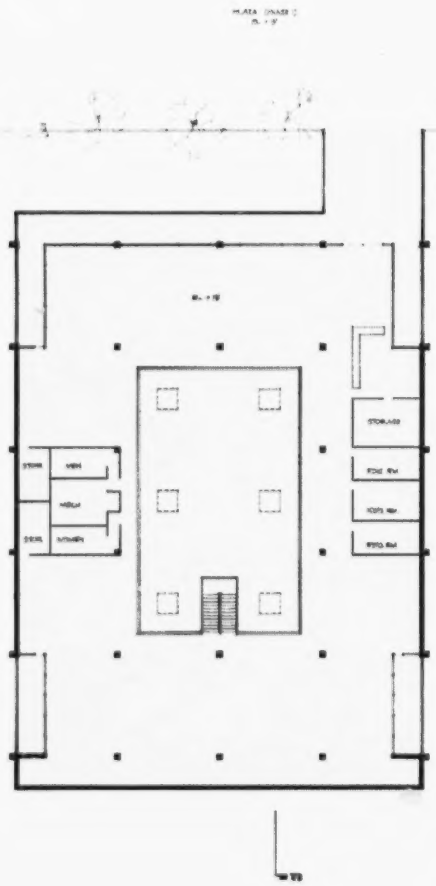
Multi-Purpose Room (shelter area)



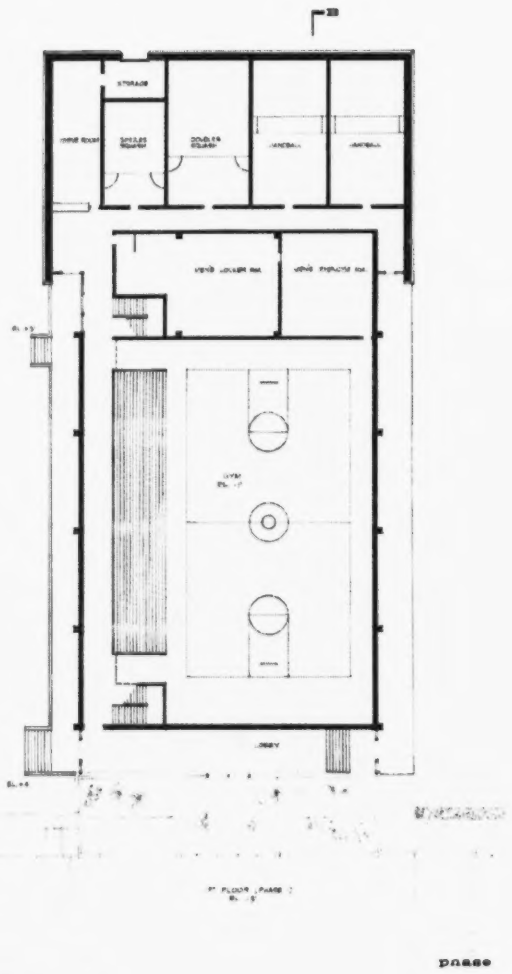
Phase 1 Floor Plan (nucleus)

First Floor Plan

Phase 2 Library

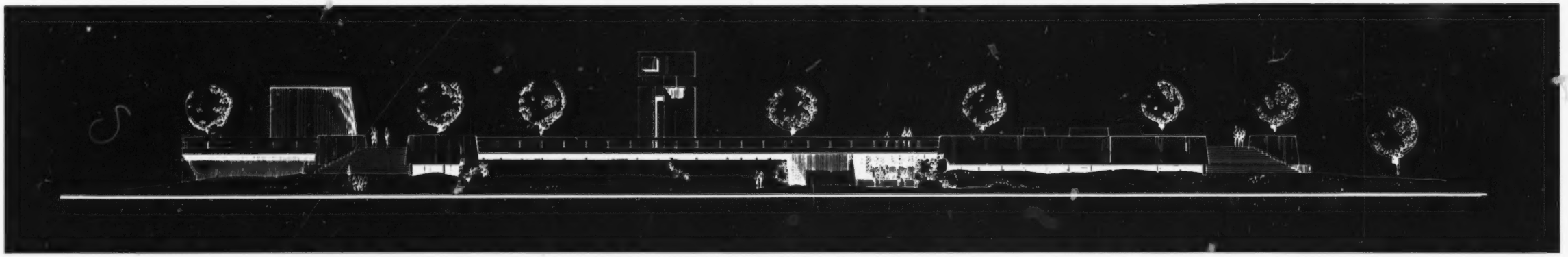


Second Floor Plan

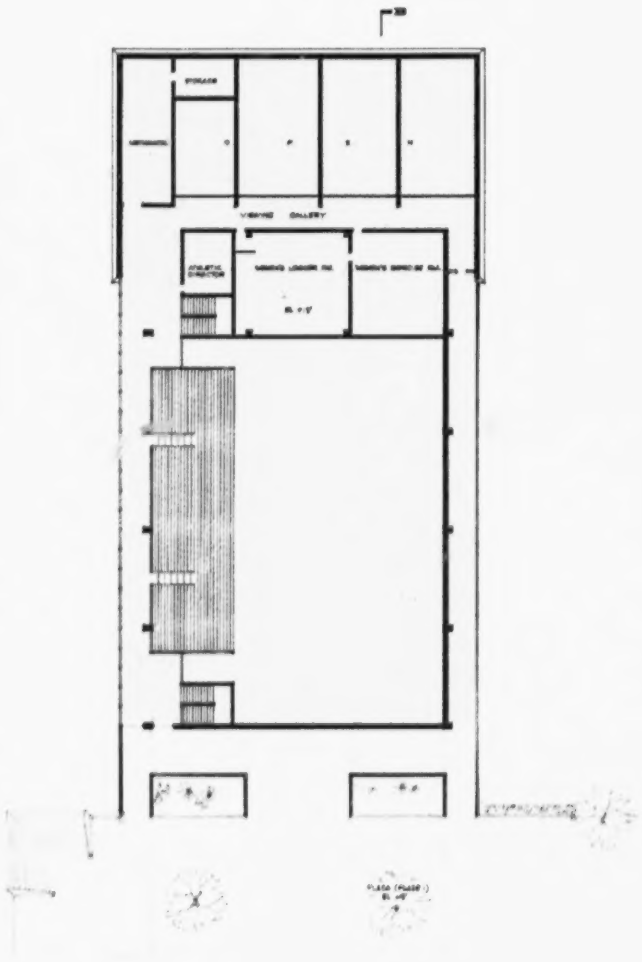


First Floor Plan

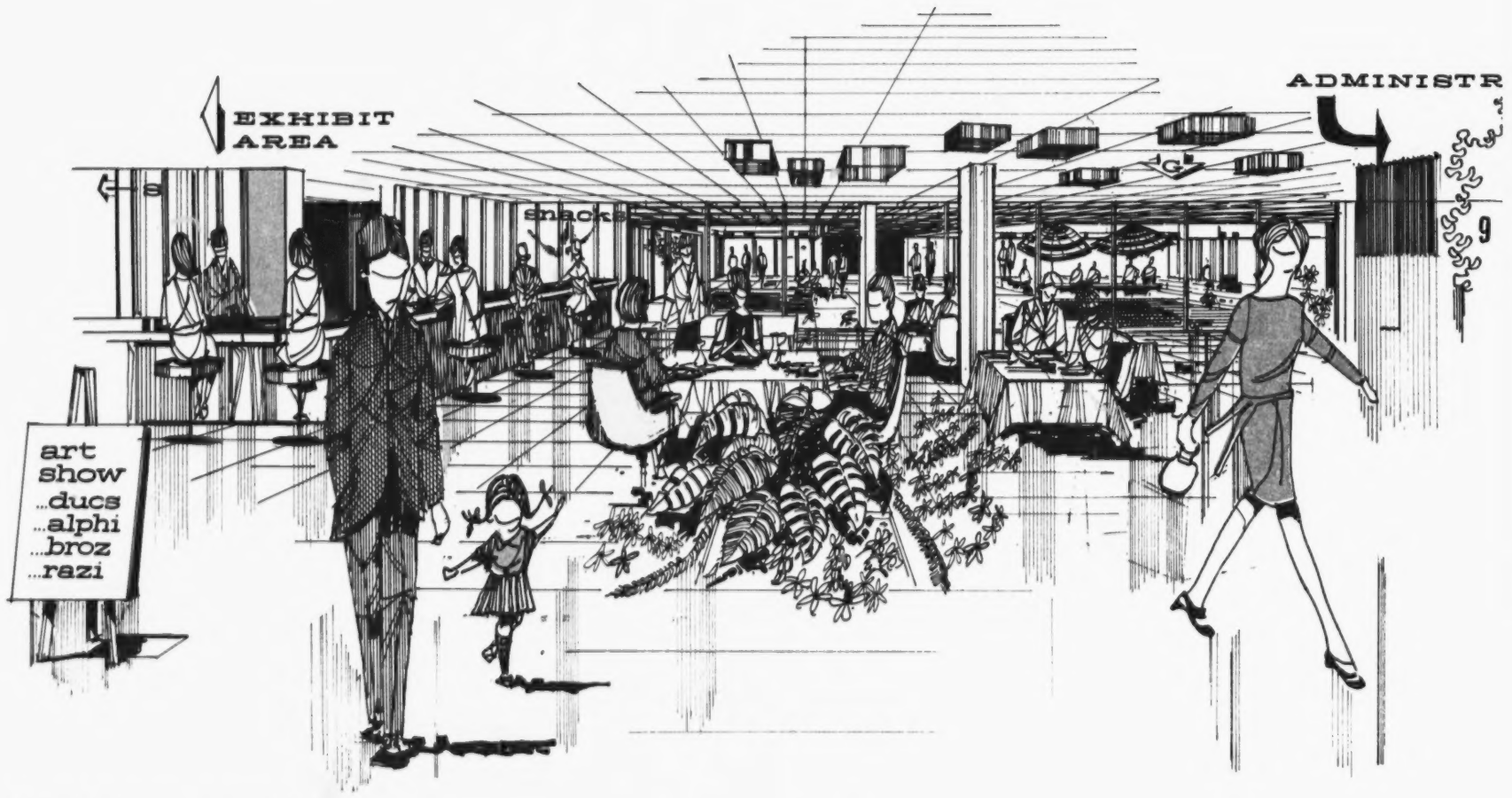
Phase 3 Gymnasium



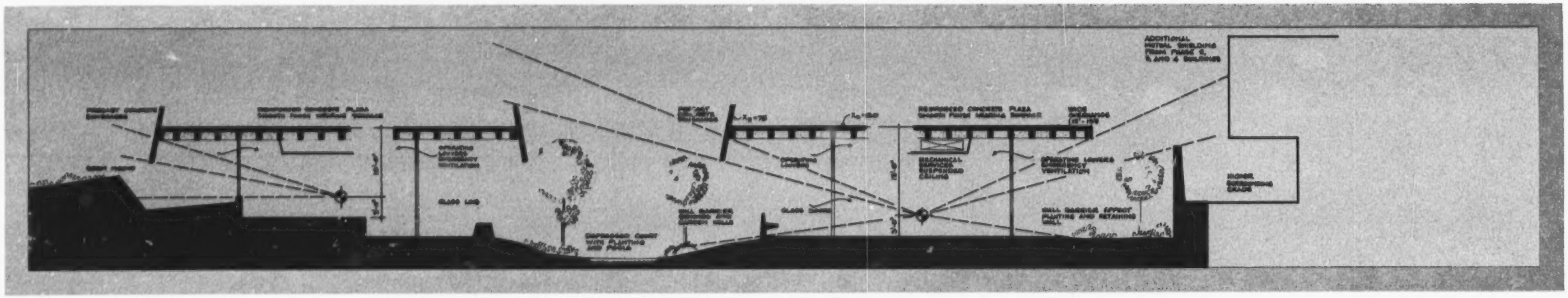
West Elevation (1st phase)



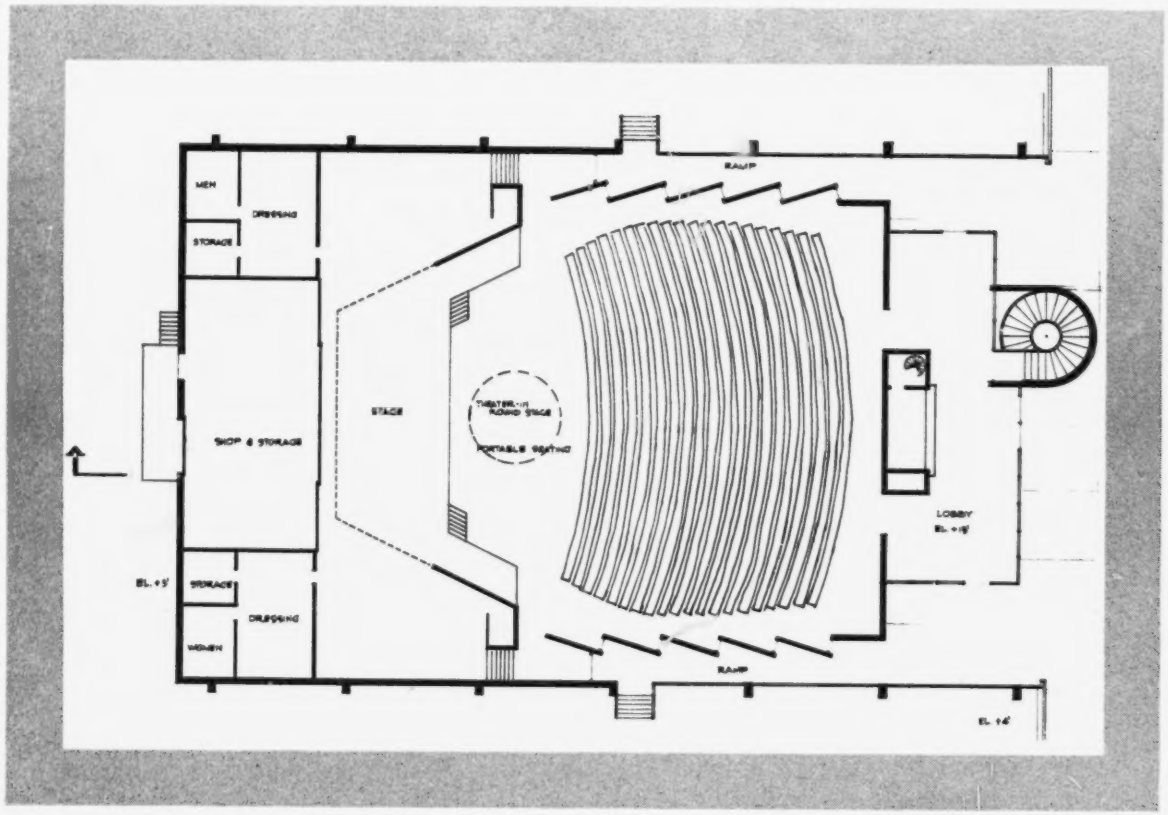
Second Floor Plan



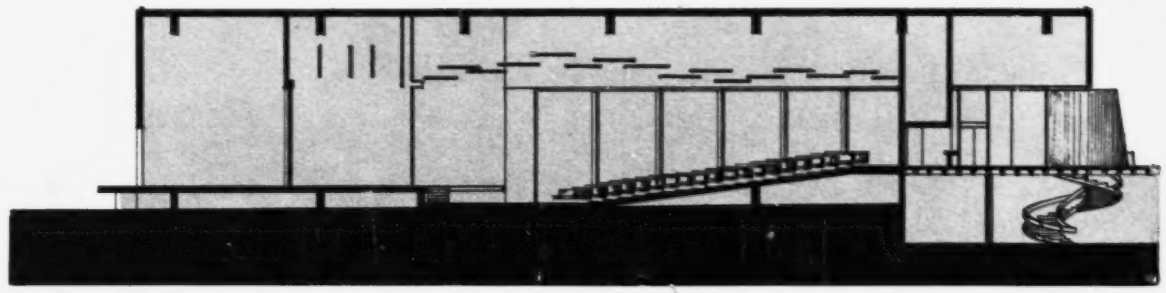
View of Lounge (shelter area)



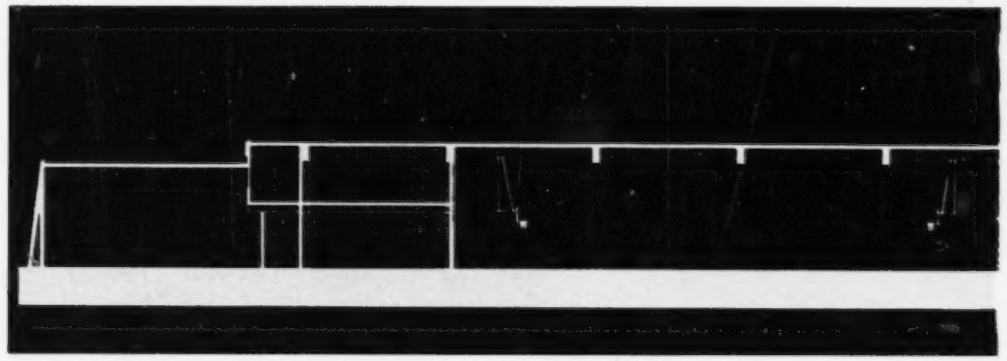
Shelter Schematic



Plan



Section AA



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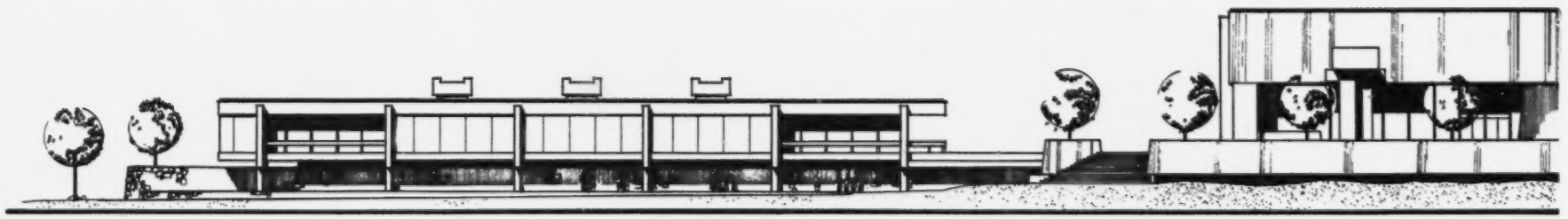
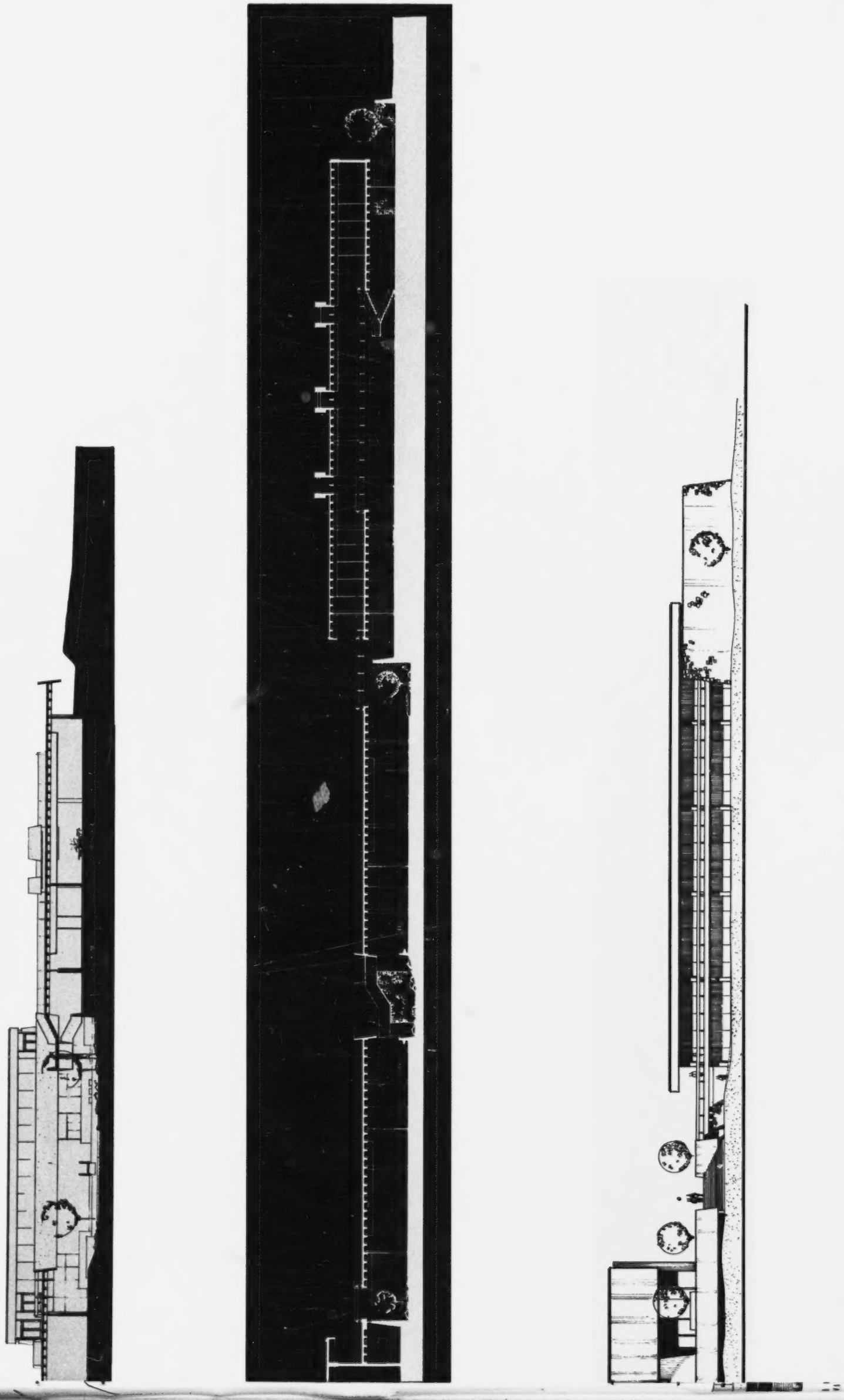


Elevation



Region 1

FIRST PRIZE

Wladyslaw J. Otorowski, *Architect*
Professional Associates
West Hartford, Connecticut

Team Members
Arthur H. Alden, *Architect*
Raymond H. Loomis, *Engineer and Fallout Shelter Analyst*

Jury Comment

In the development of the site, parking facilities have been located to provide convenient access from all directions, with acknowledgment of the heavier demand from the adjacent residential sections. The Jury, nevertheless, questioned access from the northwest via the extension of one of the penetrator streets and the resulting intersecting traffic problems that might be introduced, as well as the remote relationship of parking to events scheduled in the auditorium.

An open court or plaza forms a nucleus around which the auditorium, gymnasium and library are grouped, providing a desirable central vehicular and pedestrian entranceway. Circulation to the auditorium and library is convenient and direct, although less so for the gymnasium.

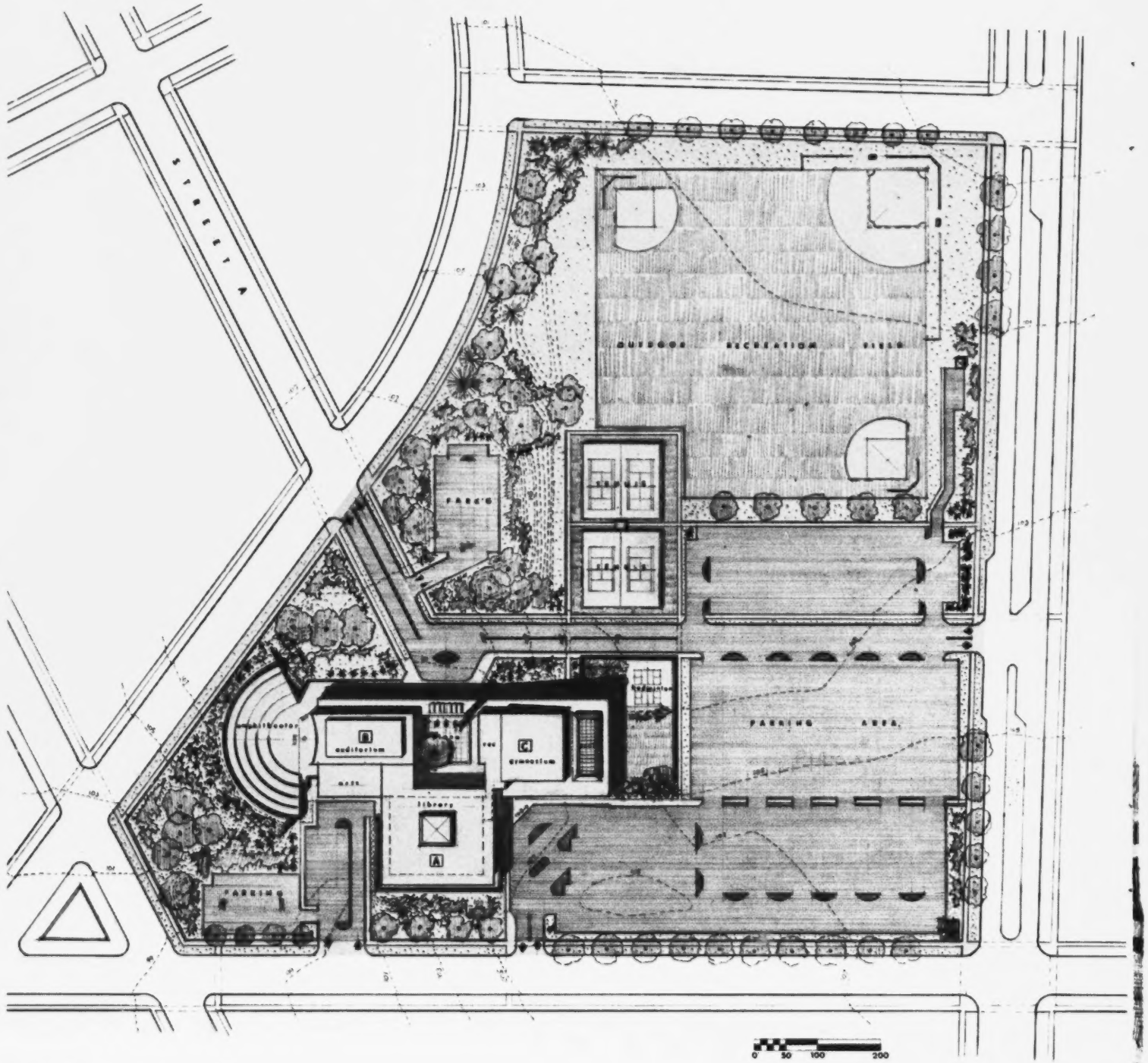
The use of wide concrete roof projections with deep fascias provides shielding, as do the overhead floor and roof construction and the surrounding walls and earth berms. The exterior treatment is sensitively handled and in keeping with the character associated with a center for community activities.

Analyst Comment

The main shelter is located in the lower level of the library building. Lowering the building into the ground has eliminated most of the ground direct contribution. The sunken terrace allows a feeling of openness in the shelter area. The overhangs above will reduce the level of contamination in the terrace. Mobile book racks provide additional mass shielding to the prime shelter area.

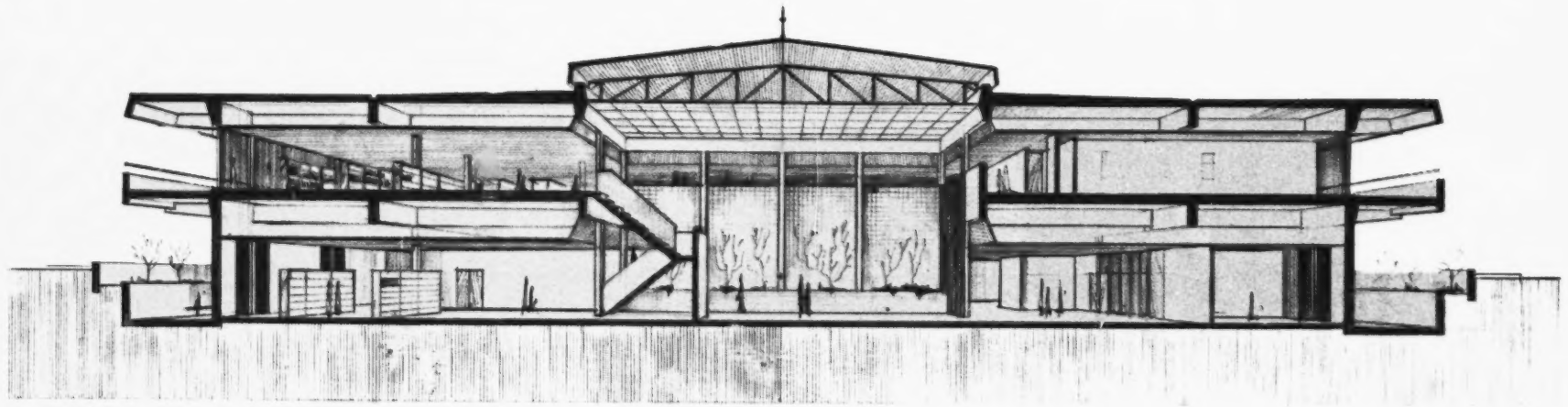
The central well, while not used as shelter, increases the habitability of the prime shelter area by providing visual openness and a large volume for natural ventilation.

Additional shelter spaces are provided in the lower levels of Buildings B and C by taking advantage of the barriers and geometry factors inherent in multistory construction.



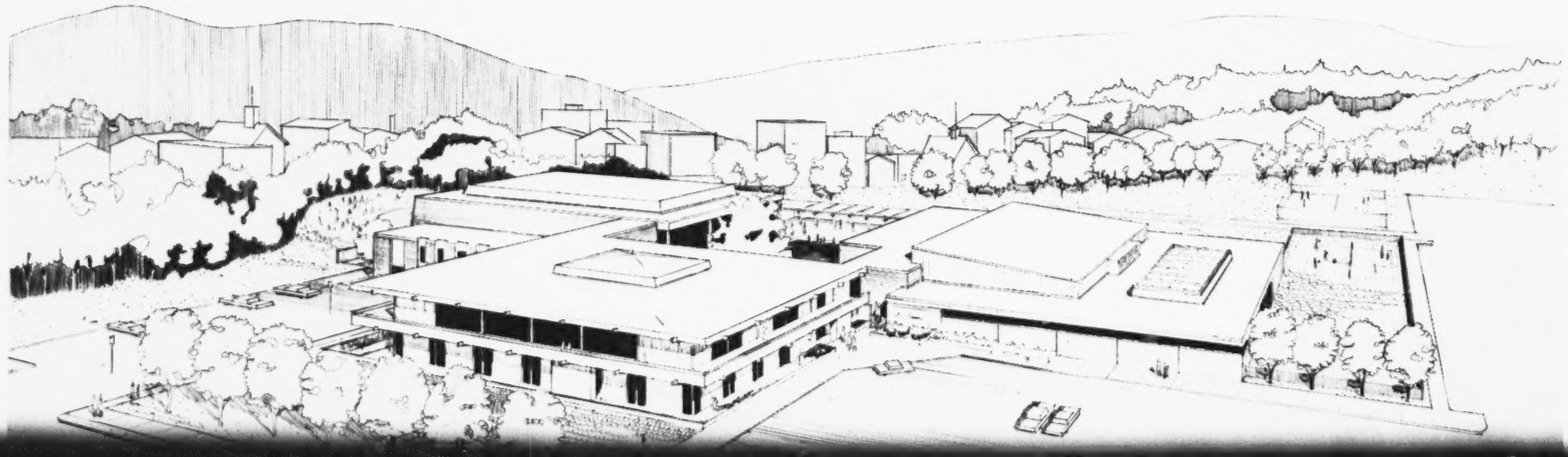
Plot Plan

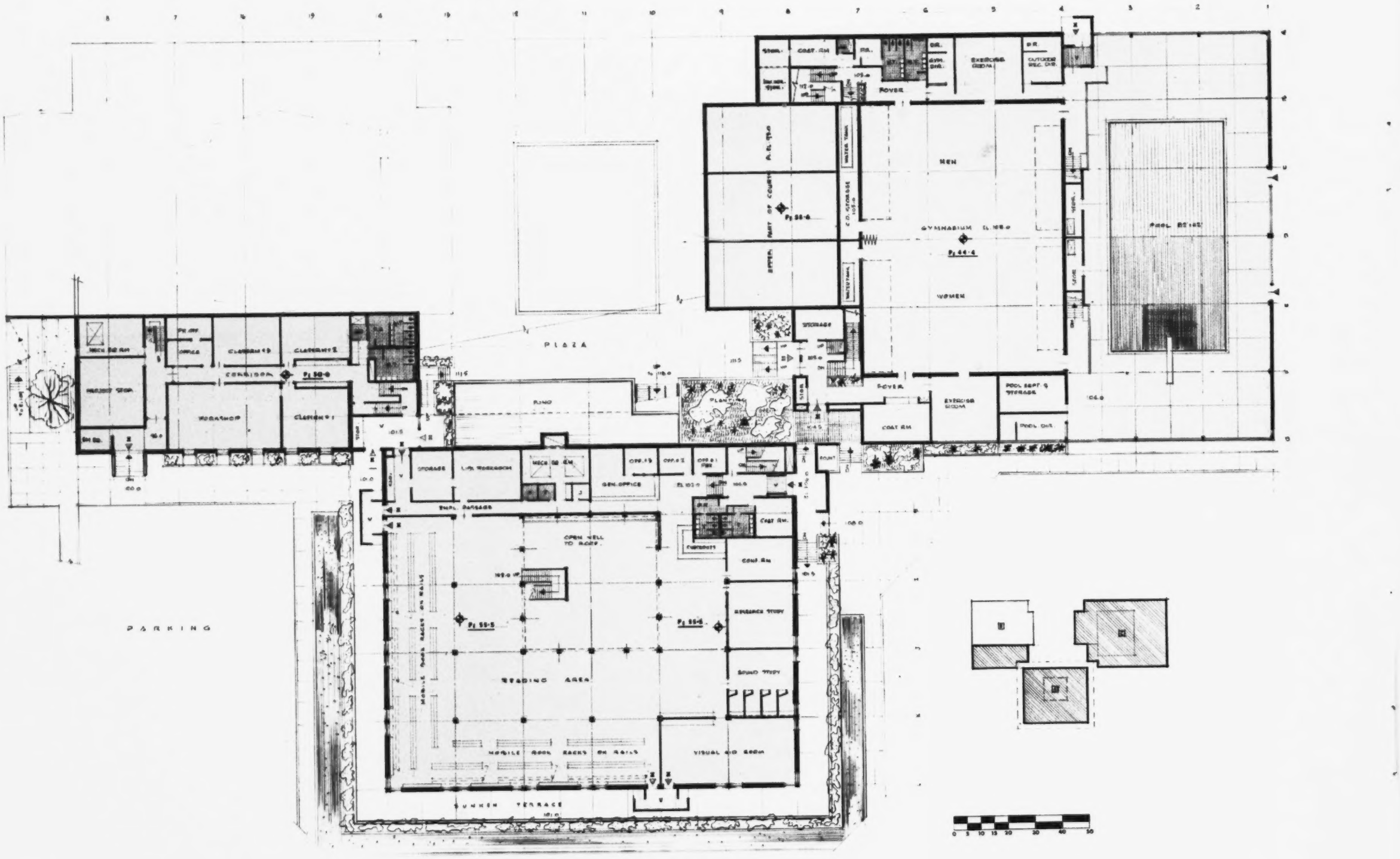
Perspective of Court



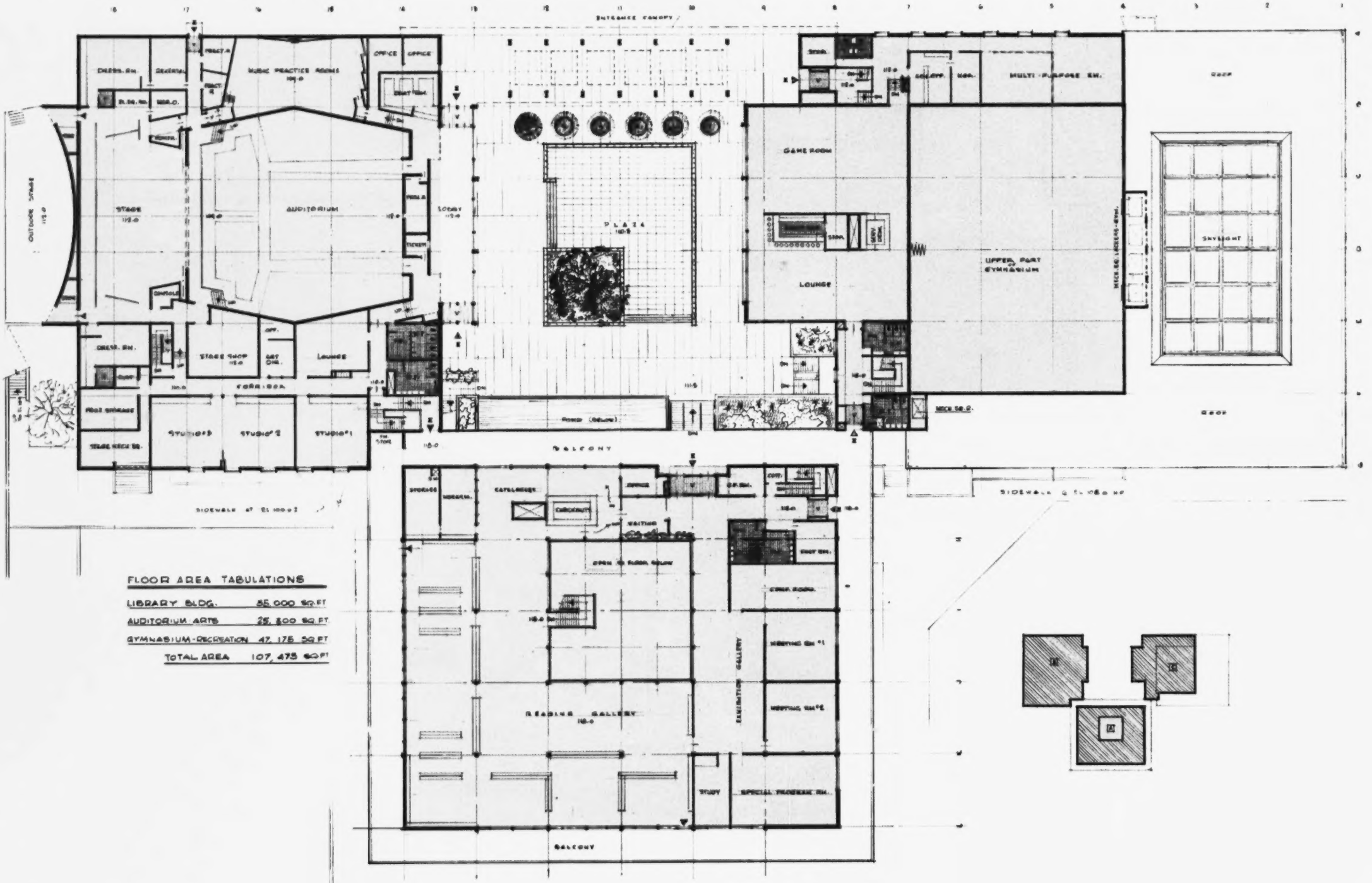
Interior of Library Shelter Area

Perspective Looking North




PLAZA
PARKING
MEN
WOMEN
GYMNASIUM
FOYER
EXERCISE ROOM
COAT RM
STORAGE
CORRIDOR
WORKSHOP
OFFICE
PLANTING
FUND
GEN. OFFICE
OPEN WELL TO ROOF
READING AREA
MOBILE BOOK RACKS ON RAILS
VISUAL AID ROOM
SUNKEN TERRACE
RESEARCH STUDY
SOUND STUDY
CONF. RM
CUSTODIES
0 5 10 15 20 30 40 50

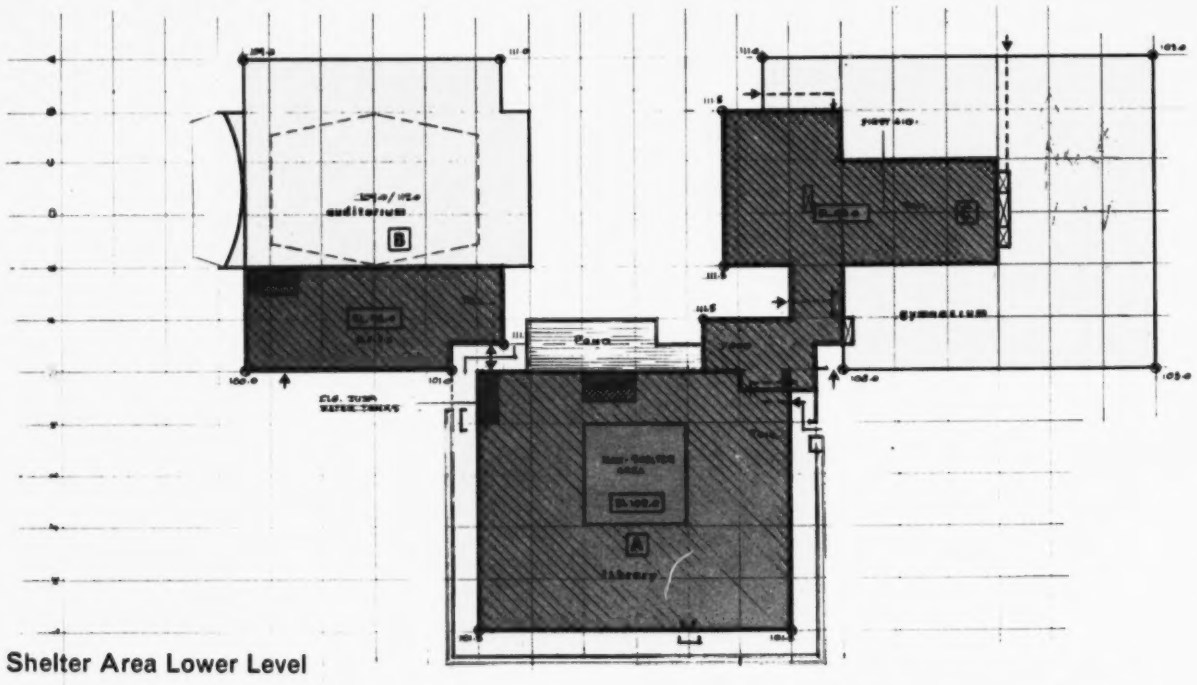
Plan



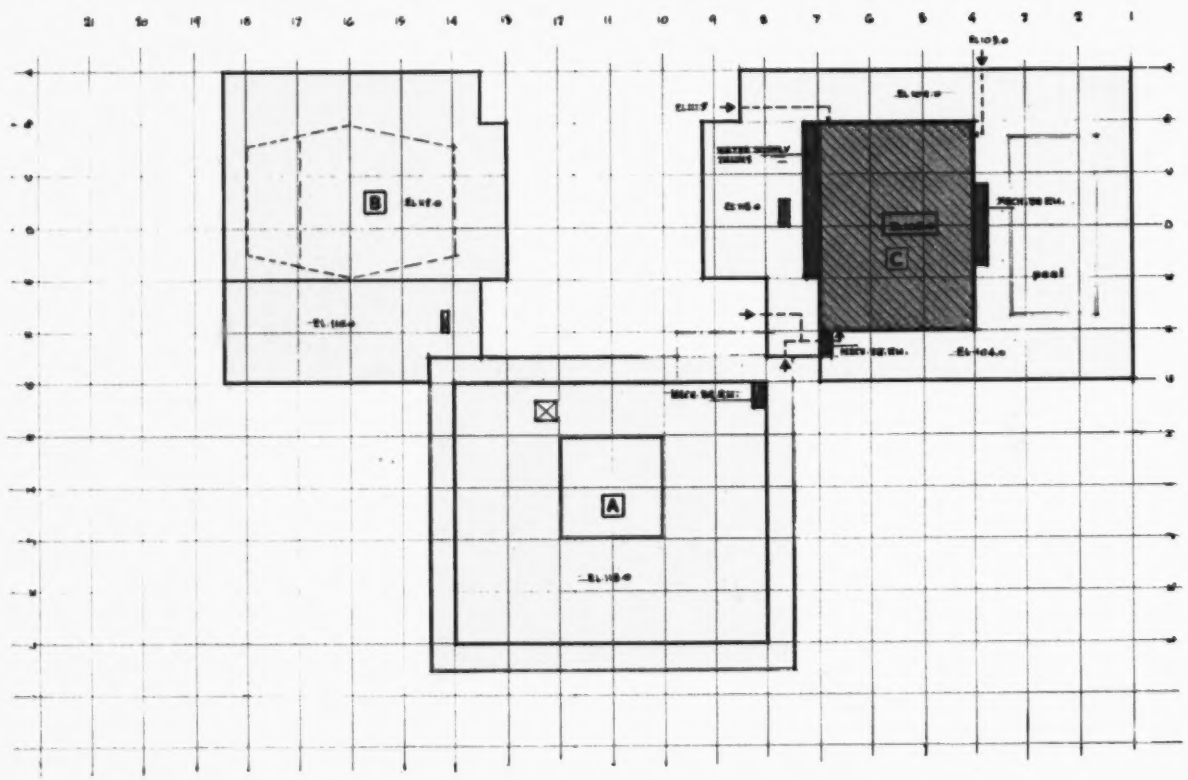
FLOOR AREA TABULATIONS

LIBRARY BLDG.	55,000 SQ.FT
AUDITORIUM ARTS	25,500 SQ.FT
GYMNASIUM-RECREATION	47,175 SQ.FT
TOTAL AREA	107,475 SQ.FT

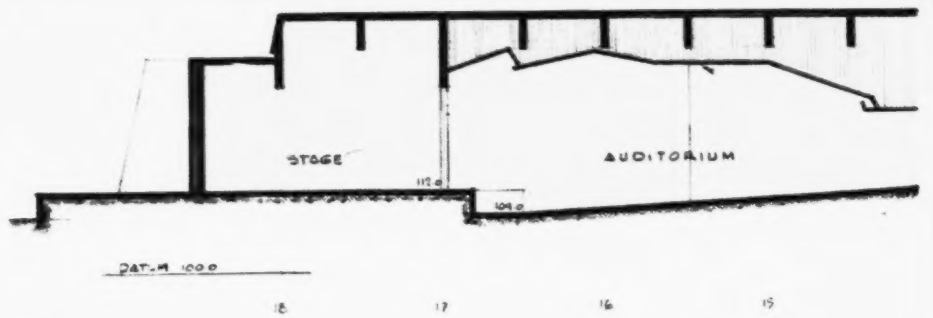
Plan



Shelter Area Lower Level



Shelter Area Upper Level



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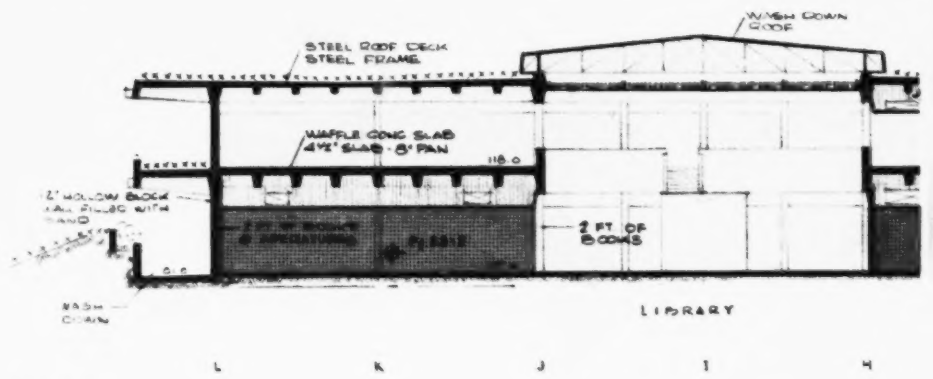

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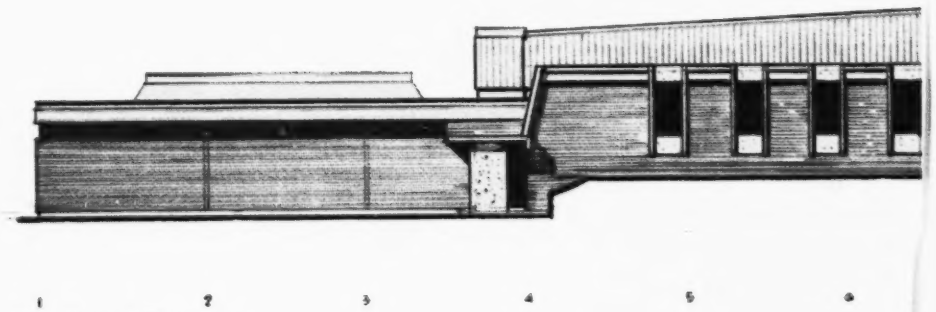
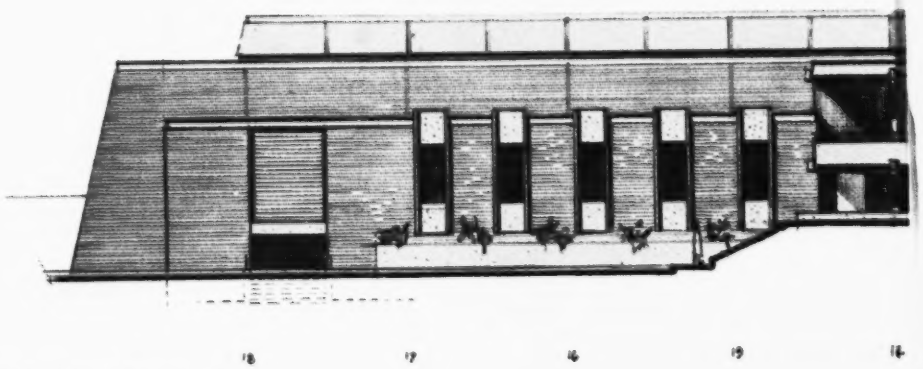
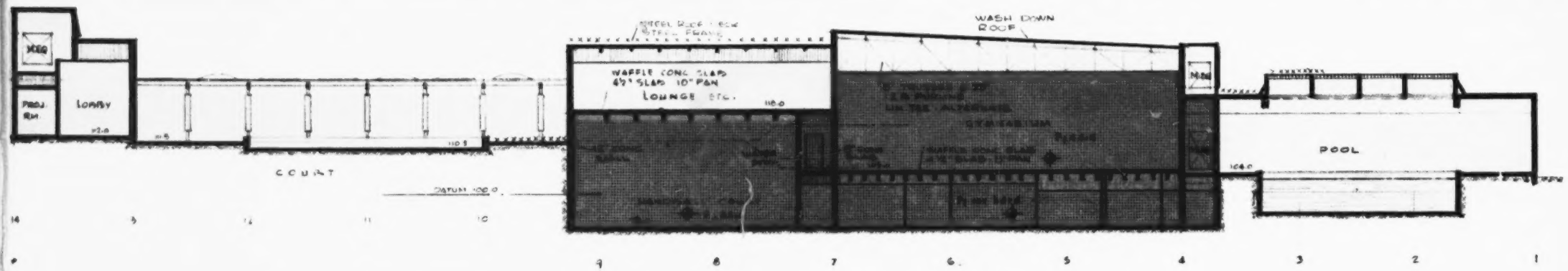


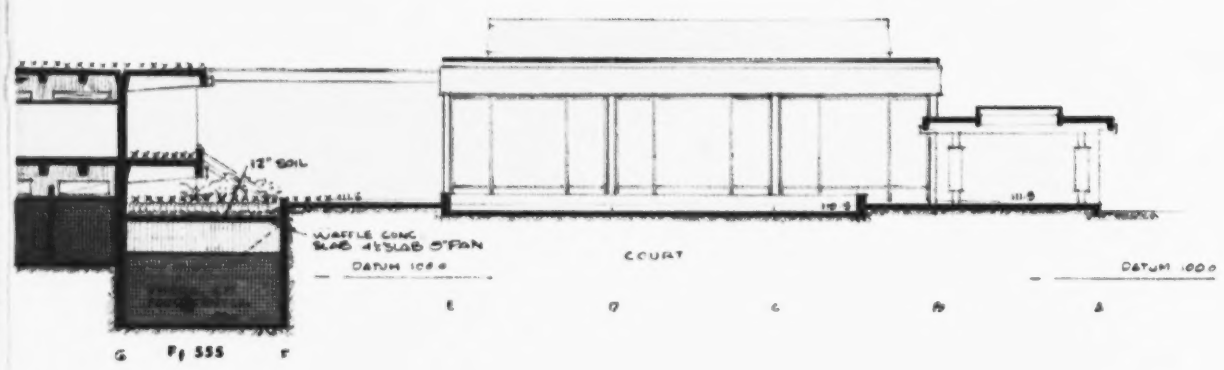
Southeast Elevation



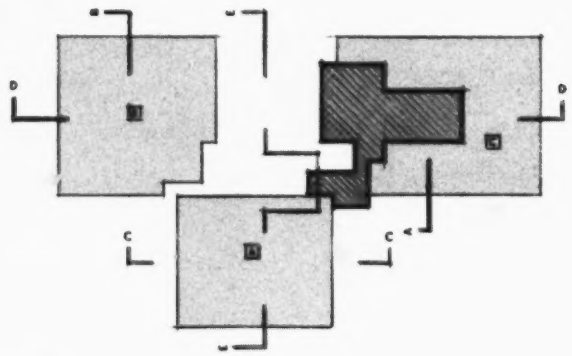
Northeast Elevation

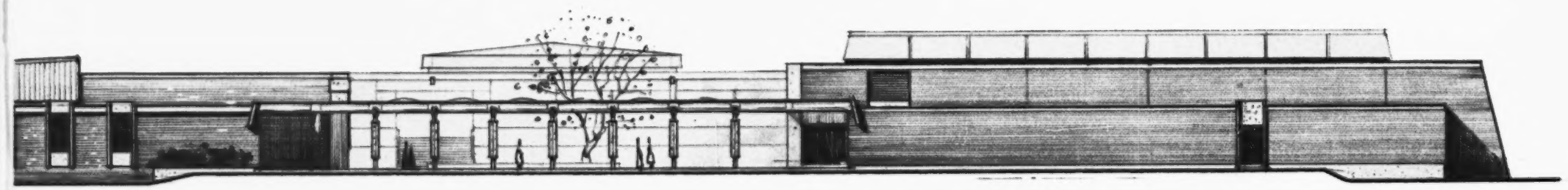


LOBBY
COURT
DATUM 100.0
WAFFLE CONC SLAB
LOUNGE ETC.
WASH DOWN ROOF
POOL

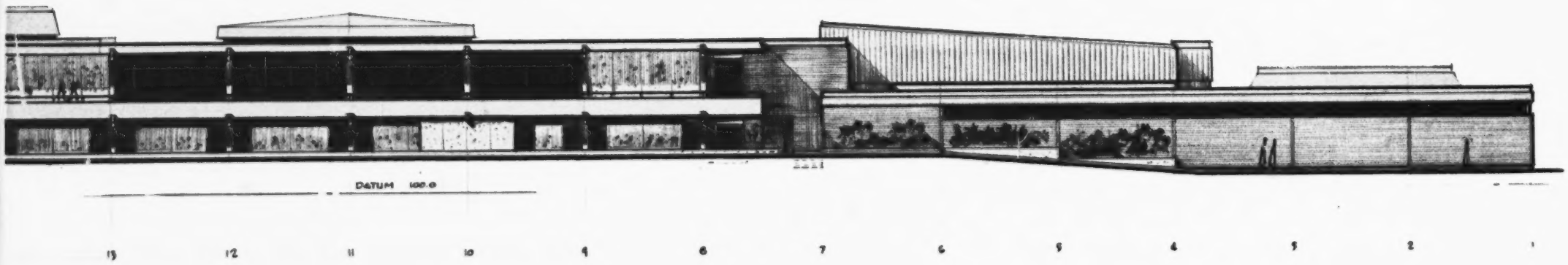


12" SOIL
WAFFLE CONC SLAB
COURT
DATUM 100.0





DATUM 100.0



DATUM 100.0

Region 1

THIRD PRIZE

Jerry Kronovet, AIA, *Architect*
Bethpage, Long Island, New York

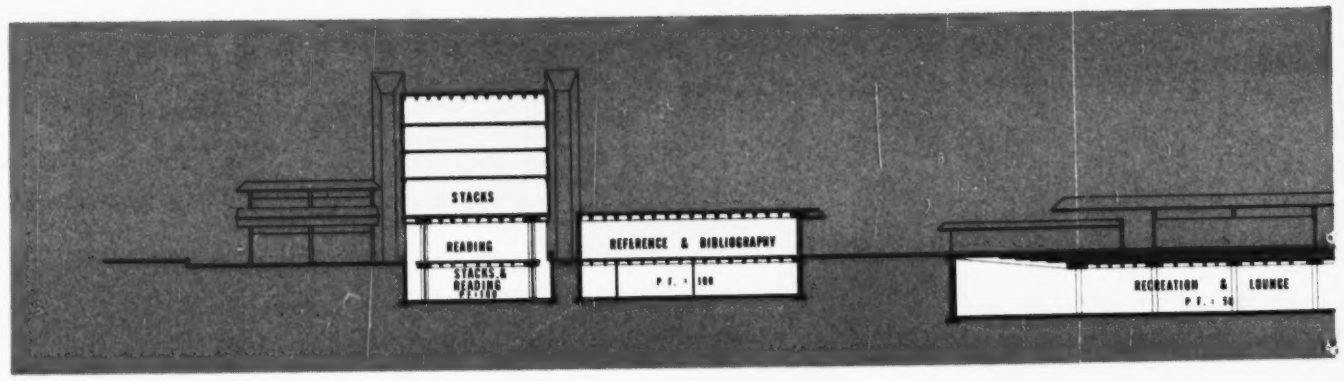
Team Members
Charles J. Ala
Ernest P. Franck
Professional Engineer and Fallout Shelter Analyst

Jury Comment

The site is a well conceived development with buildings at the south portion of site, facing residential areas, well set back. Parking is well distributed, and noisy active recreation facilities are located at the north toward commercial and industrial areas. The plaza forms a focus for buildings at the upper level. Vehicular and pedestrian access is good except for the library where the entrance is hidden from vehicular approach and somewhat obscured for pedestrians. Composition of multipurpose room and gymnasium is very good, but the height and complex form of the library was questioned. Provision for completion of the project in several construction increments was well thought out. The organization and sense of order between multipurpose and gym in both plans and elevations is good.
The character of the complex is appropriate to a community center, but excessive structural measures are used to achieve protection.

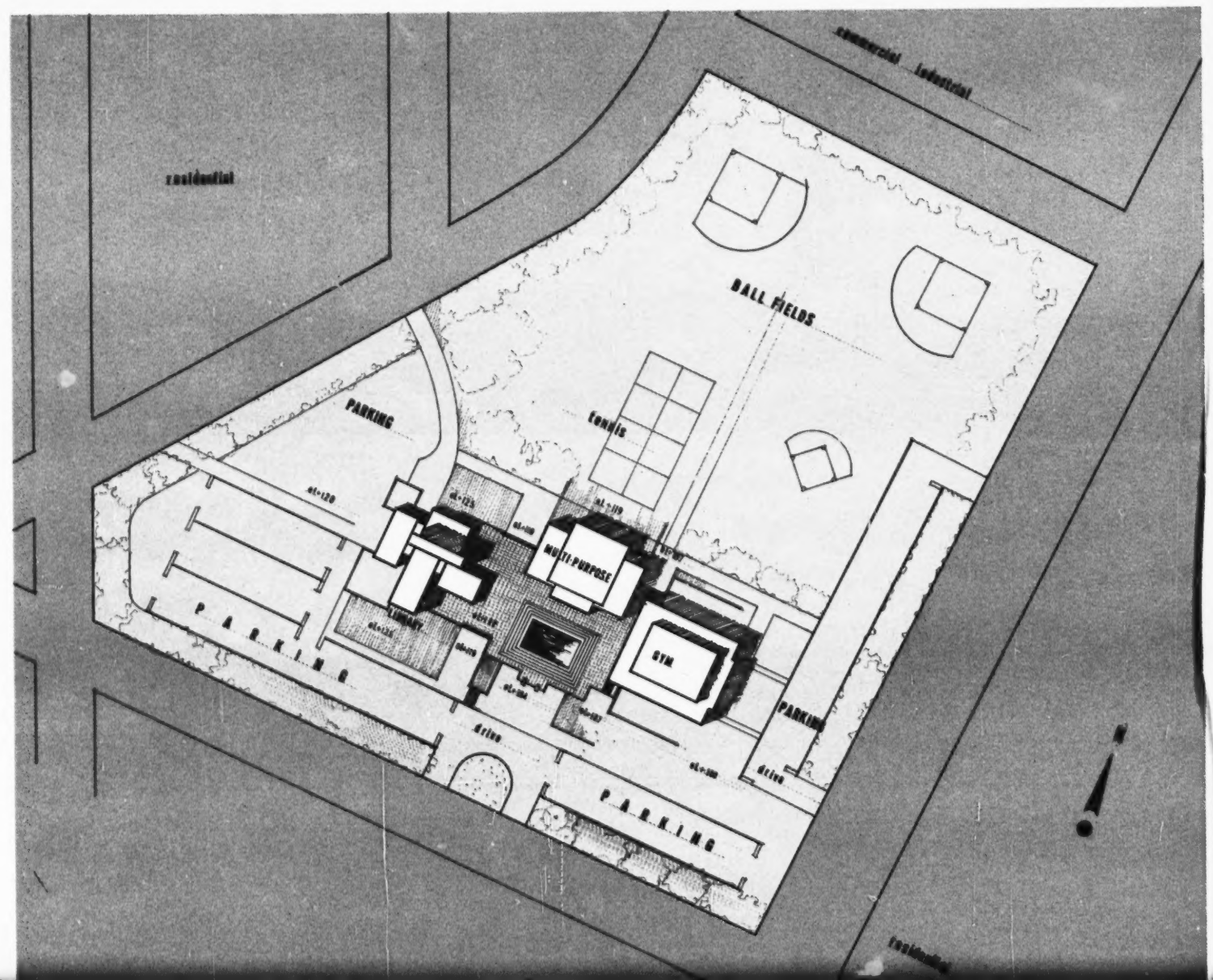
Analyst Comment

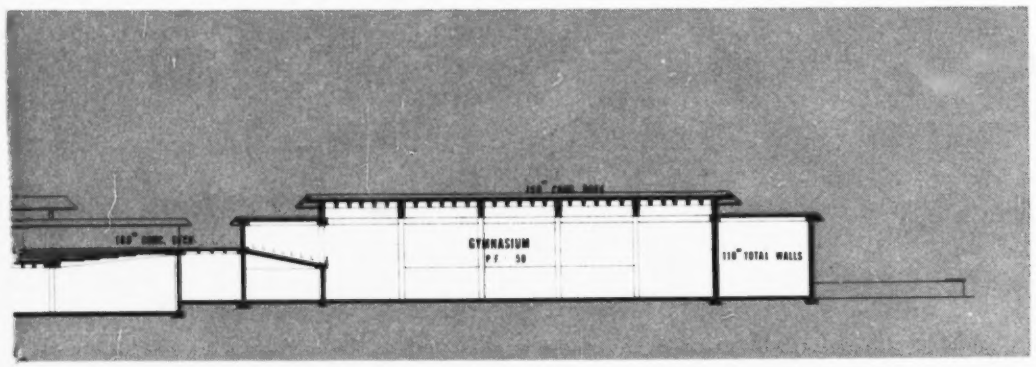
The shelter is located in the gymnasium, library, multipurpose room and recreation area. This dispersion of occupants is desirable in terms of shelter control and management. Shelter supplies are very conveniently located to all areas. All entrances are shielded. The natural slope of the site has been used to some advantage to minimize ground direct contribution.

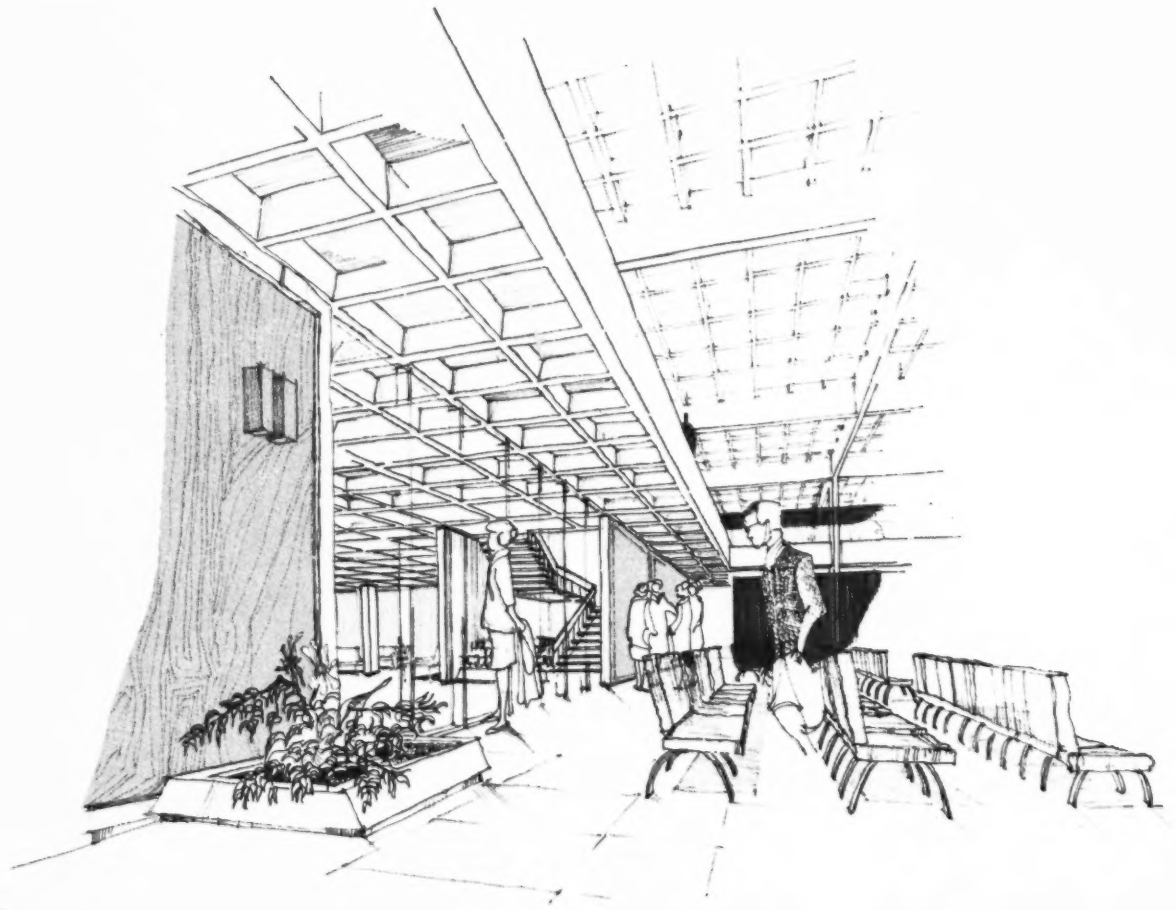


Section

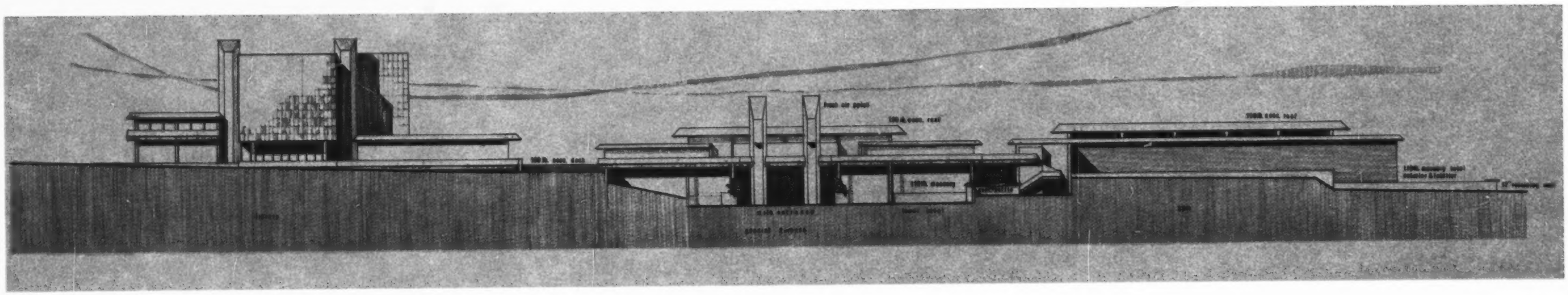
Site Plan







Multipurpose Room



South Elevation

Region 1
CERTIFICATE OF MERIT

Hanford Yang
Professor, *School of Architecture, Pratt Institute*
New York City

Team Members
Secundino Fernandez
Herbert Rusinoff, *Fallout Shelter Analyst*

Jury Comment

The site plan respects the residential nature of the community. Pedestrian and vehicular access is good. The various elements are used to form a compound with interesting courts. Scale is well adjusted. The configuration of individual elements is well conceived and there is a unified character to the whole.

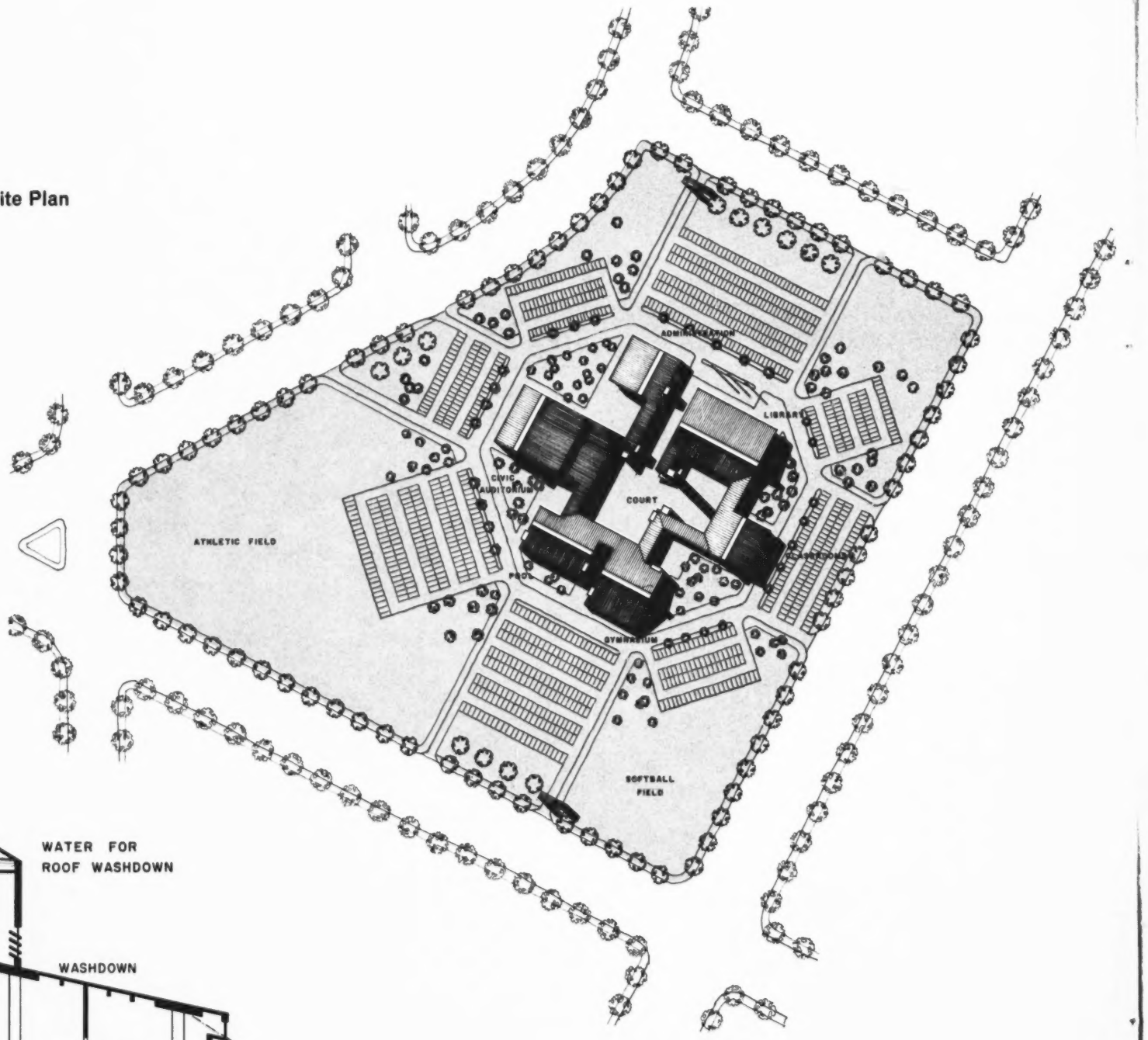
Analyst Comment

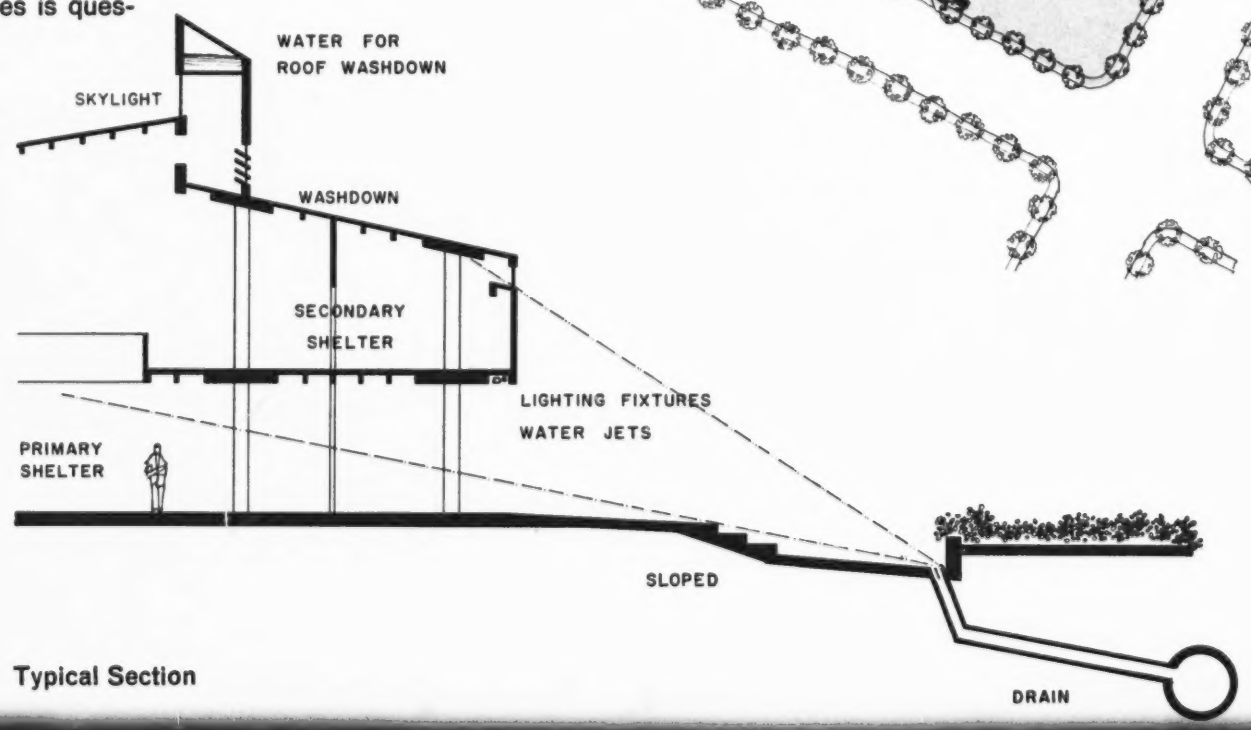
Fallout shelter space is provided throughout all the main buildings in this complex. The buildings have been located around a court, thus taking advantage of mutual shielding afforded by the adjacent structures.

In achieving the PF as shown, a washdown system was used. However, even without the washdown system the OCD standard protection factor of 40 is achieved.

The inclusion of single-use decontamination facilities is questionable.

Site Plan





Typical Section

Courtyard Perspective

Region 2
FIRST PRIZE

Gilbert H. Coddington, FAIA and
George M. Clark, AIA,
Architect, Engineer and Fallout Shelter Analyst
School of Architecture
The Ohio State University
Columbus, Ohio

Team Members
William L. Everhart
David W. Fritsche
Henry L. Hiner
Douglas E. Weatherby

Jury Comment

The concept of the site is excellent. Parking is concentrated on two levels (phased) at the north portion of site across from commercial and industrial areas, leaving the remainder of the site for play fields and landscaping all well suited to adjacent residential areas. Modeling of site — depressed parking and playfields — further enhances the composition. The scheme is compact and well organized spatially. The theater and gymnasium, flanking a central covered court, are partially below grade and contribute to a modesty in scale that enhances the design.

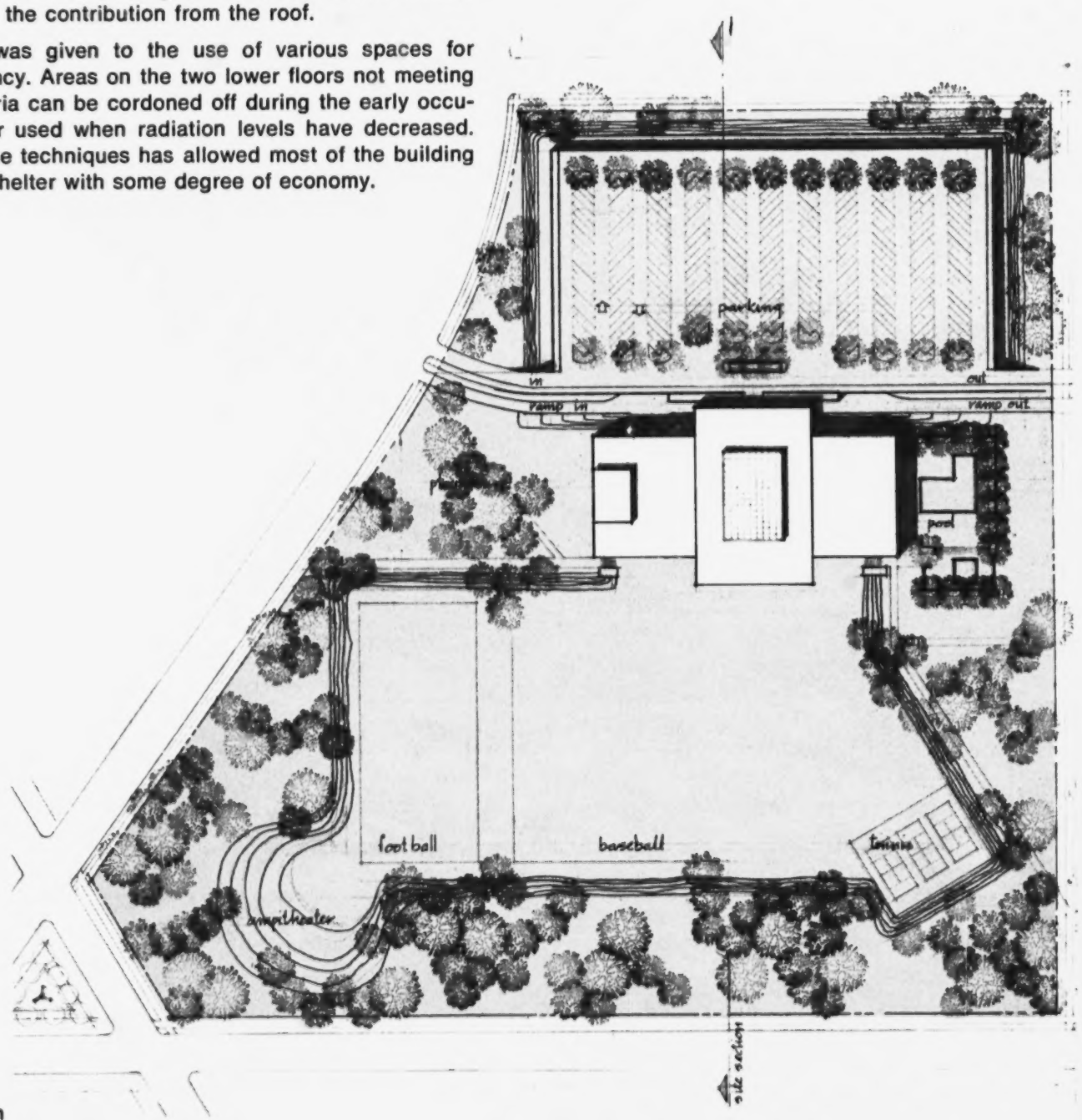
The central court, through openings at the intermediate and upper levels, serves as a unifying element and lends focus and excitement to the free-flowing space. Inwardly oriented, fenestration is held to a minimum, contributing to the simplicity of the exterior treatment without loss of interest or character.

Analyst Comment

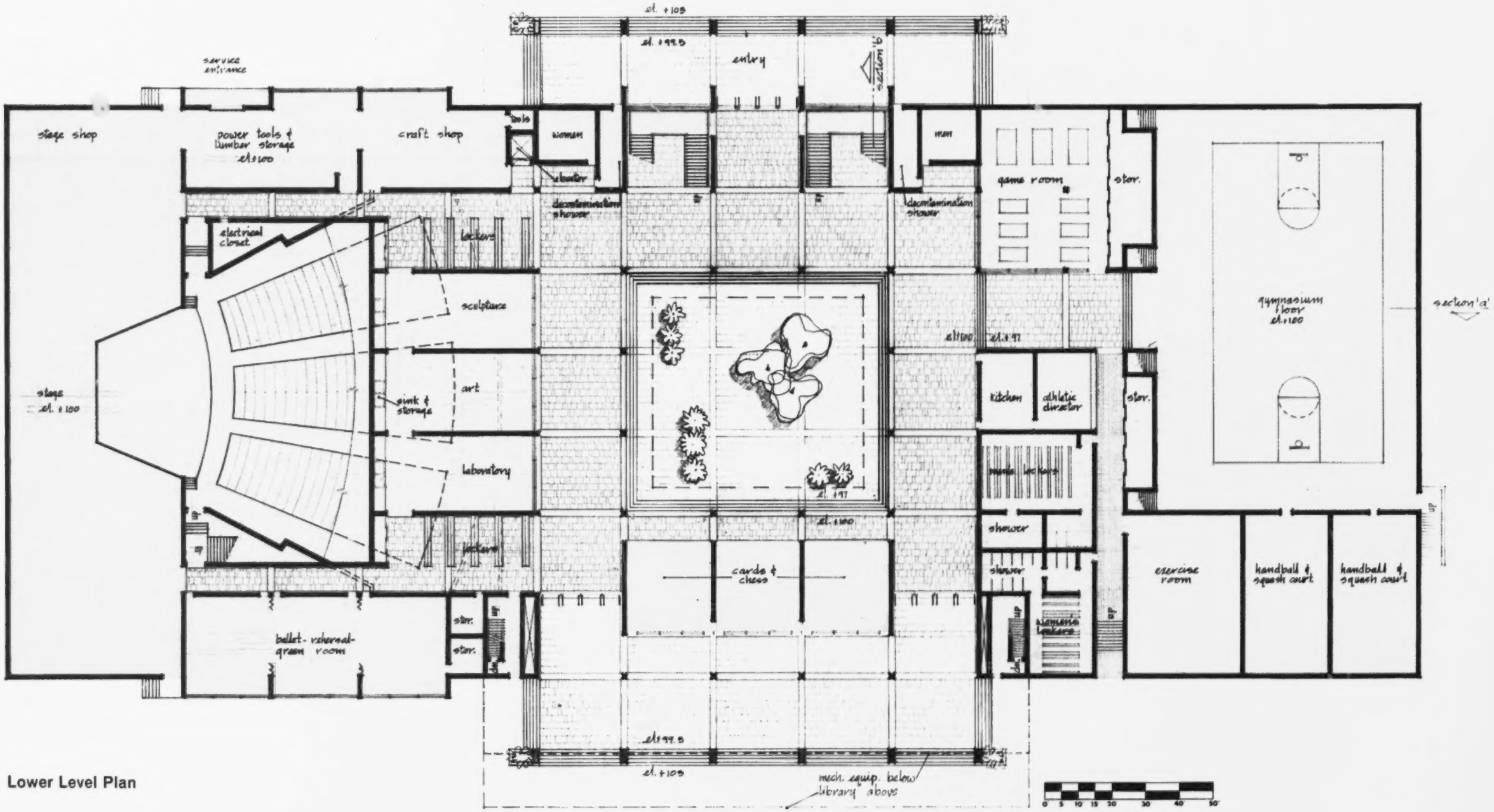
Shelter is provided in the first and second stories of the building. Careful consideration has been given to the economy of masses required for PF 40. Ground direct radiation has been greatly reduced by skillful use of geometry. This has allowed the architect to achieve an open entrance that is shielded. Skyshine contribution has been reduced by use of geometry, extending the volume of the building as it rises.

It is interesting to note that a PF of 40 is obtained in the enclosed court by the use of height and skillful use of vertical barriers to limit the contribution from the roof.

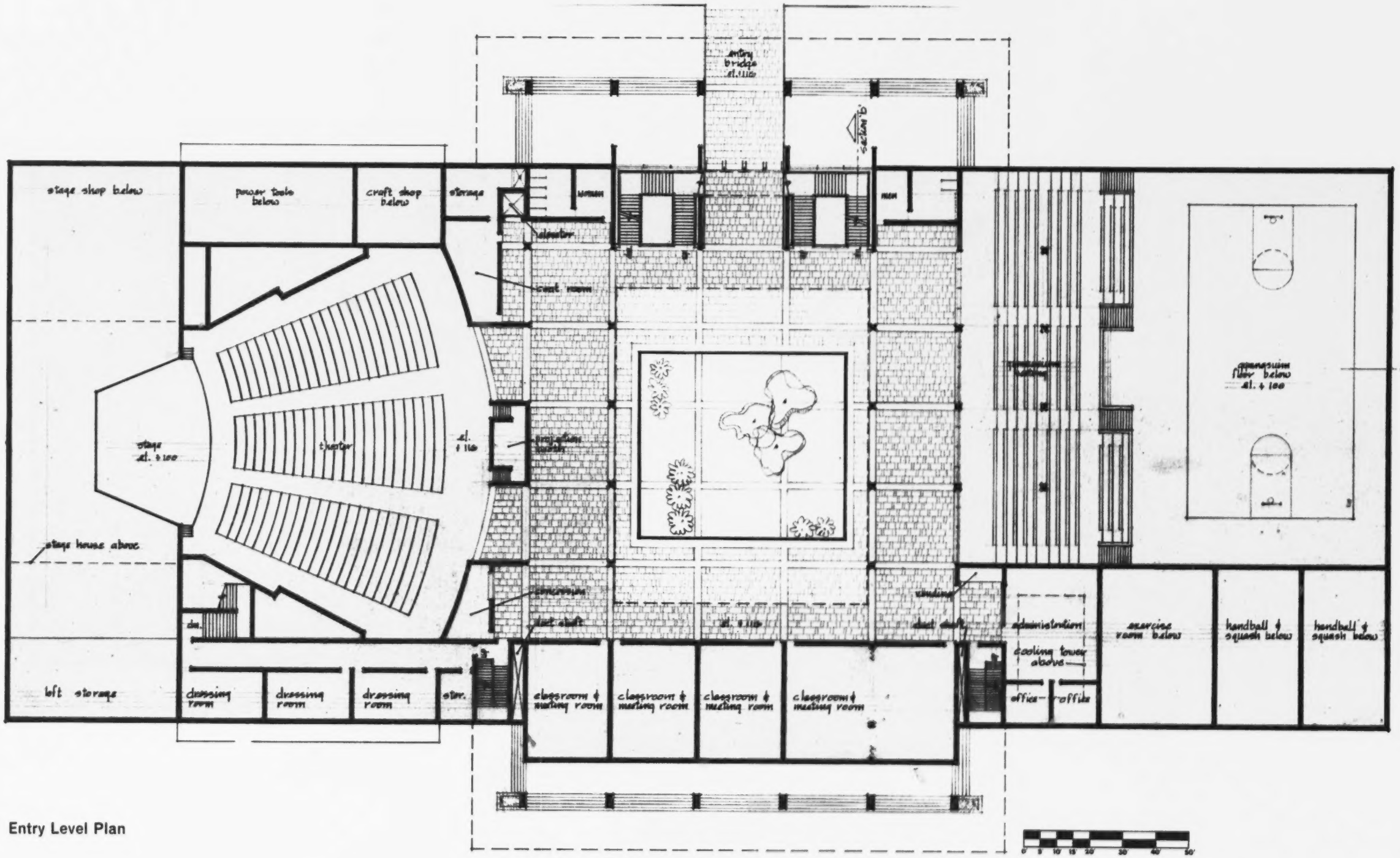
Consideration was given to the use of various spaces for shelter occupancy. Areas on the two lower floors not meeting the PF 40 criteria can be cordoned off during the early occupancy and later used when radiation levels have decreased. The use of these techniques has allowed most of the building to be used as shelter with some degree of economy.



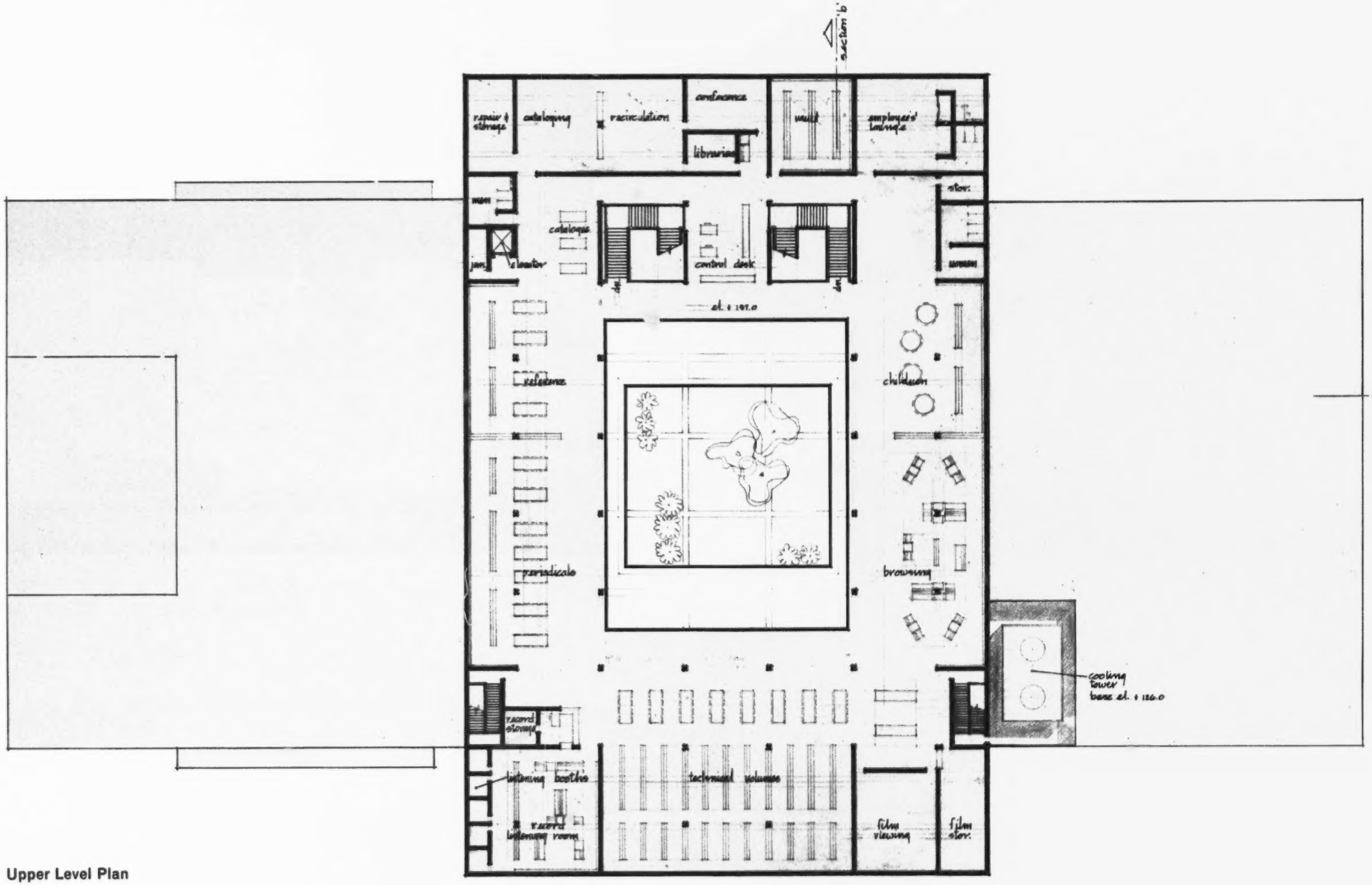
Site Plan



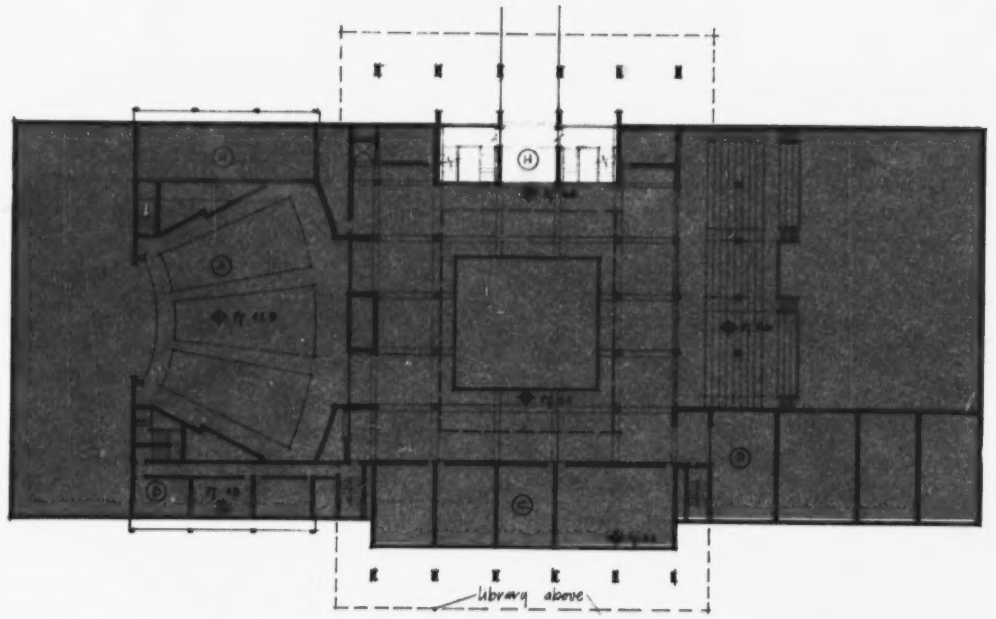
Lower Level Plan



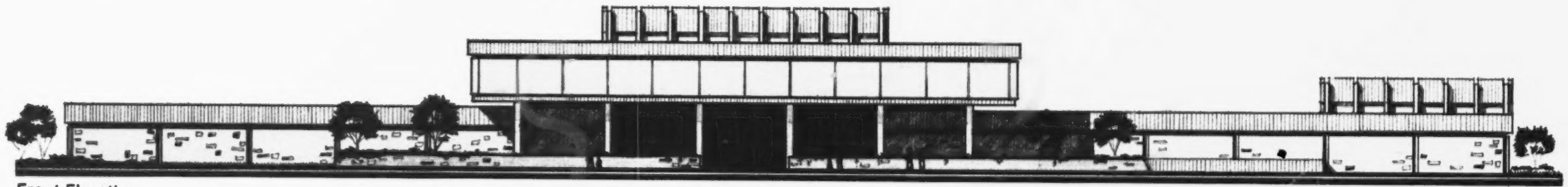
Entry Level Plan



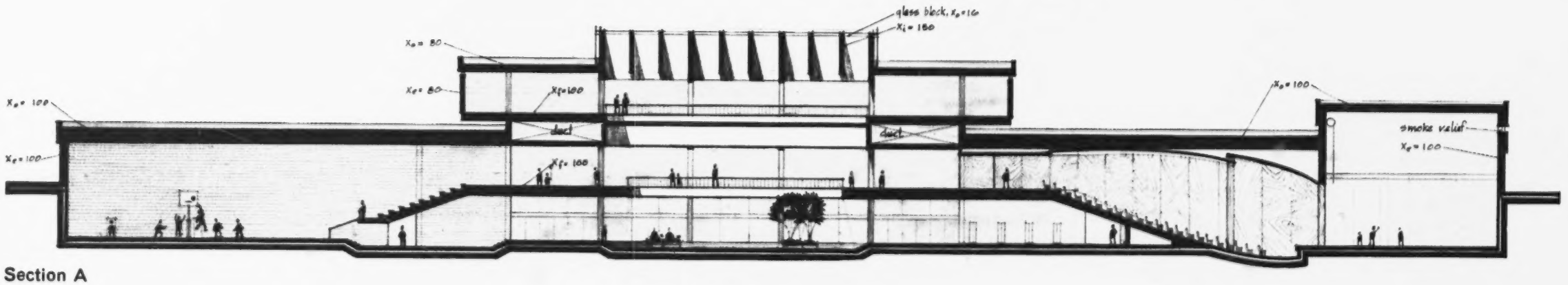
Upper Level Plan



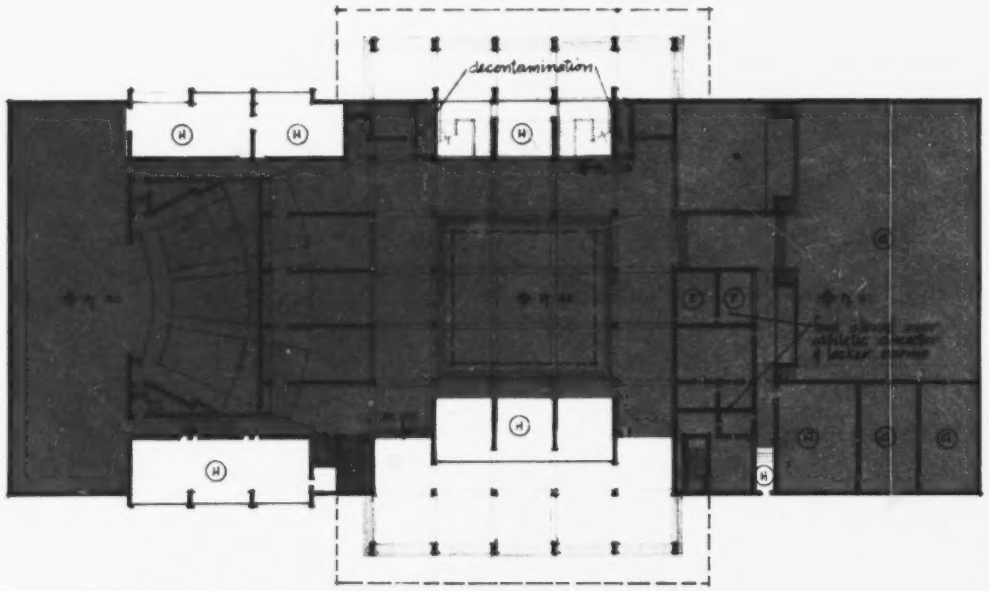
Entry Level Shelter Plan



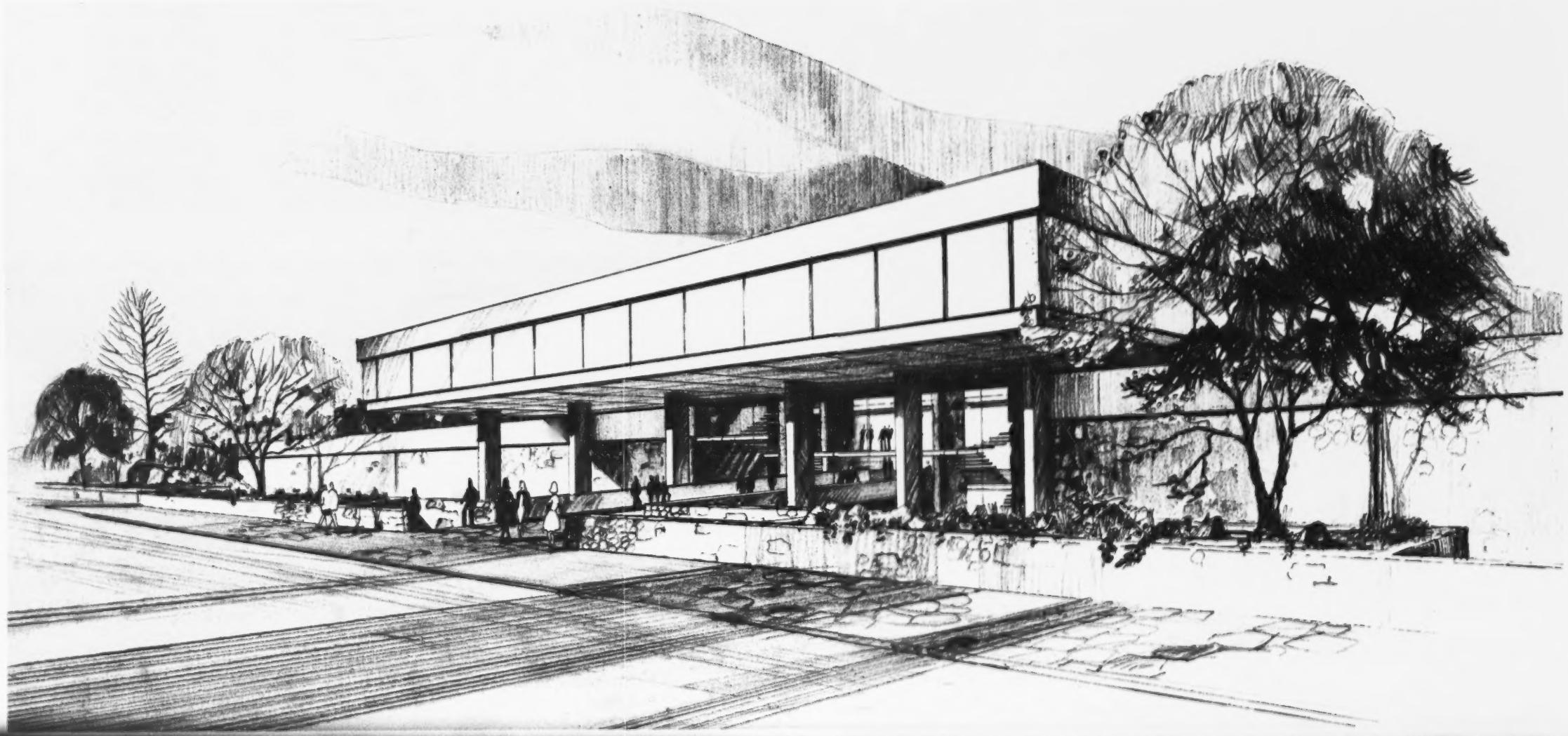
Front Elevation



Section A



Lower Level Shelter Plan



Region 2
CERTIFICATE OF MERIT

Leon K. Smith, AIA, *Architect*
Newport News, Virginia

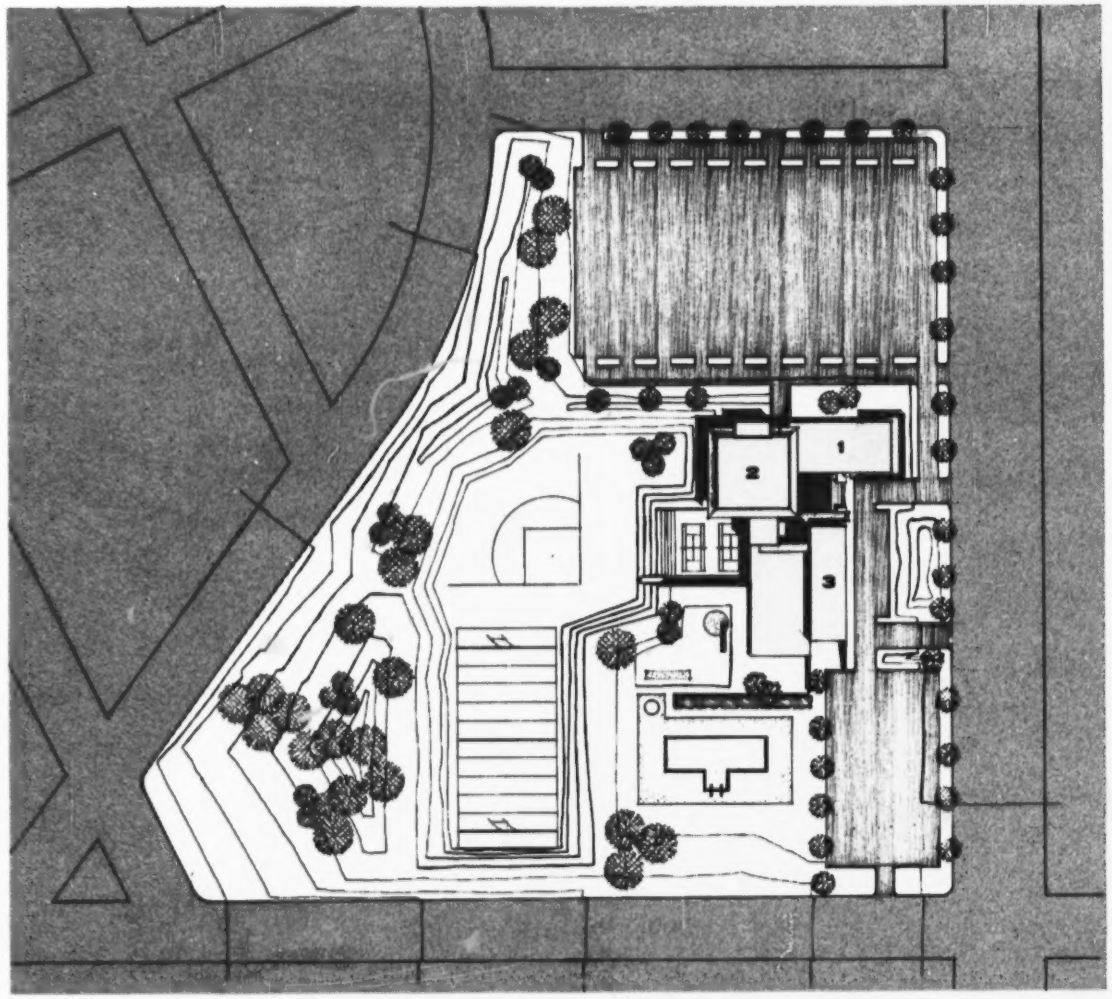
Team Members
Joseph M. Shinn, Jr., *Engineer and Fallout Shelter Analyst*
Edwin M. Moggio, *Engineer*
Robert G. Capps

Jury Comment

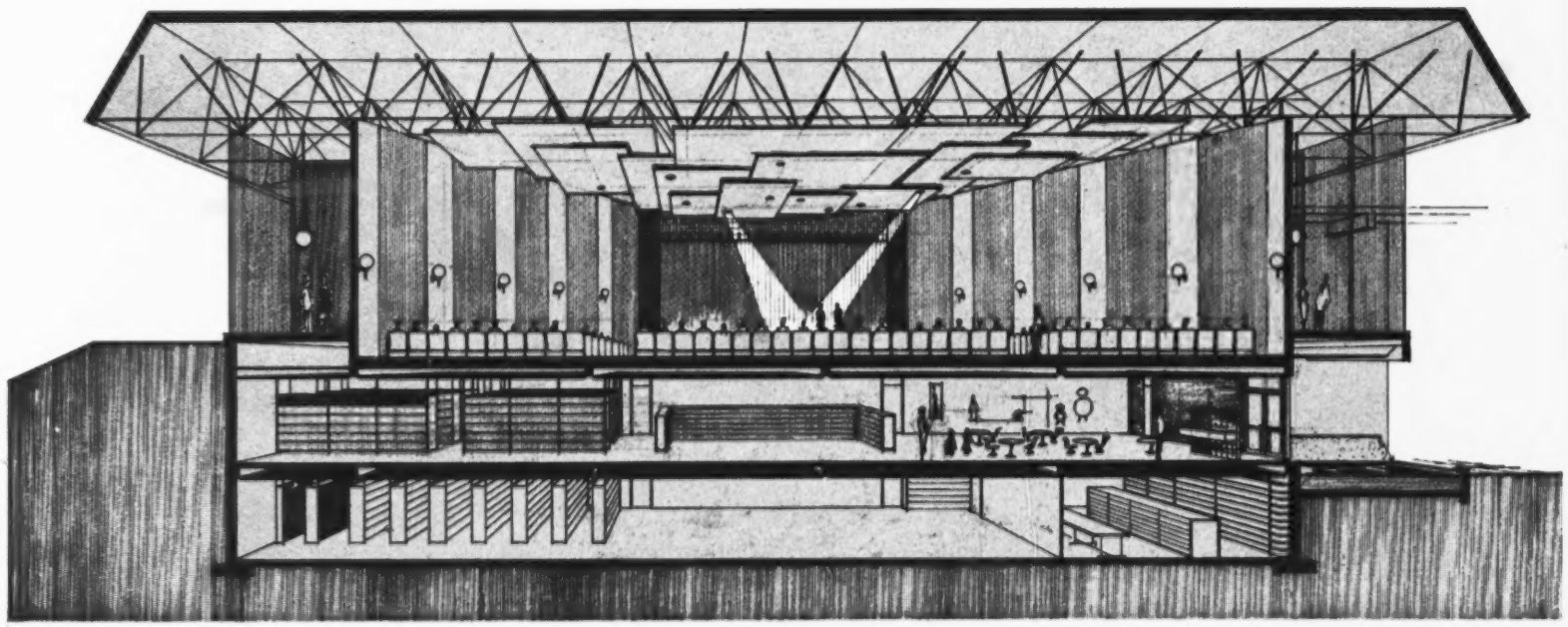
The disposition of the elements on the site is good with the major parking areas located at the north portion, away from residential areas, but access from parking to building is restrictive. The elements forming a generous entrance court are well composed but entrance to the elements is indirect and confined. The locating of the gymnasium and one floor of the library completely below grade contributes to a desirable modesty in scale of the superstructure, but can be questioned on the grounds of circulation and control.

Analyst Comment

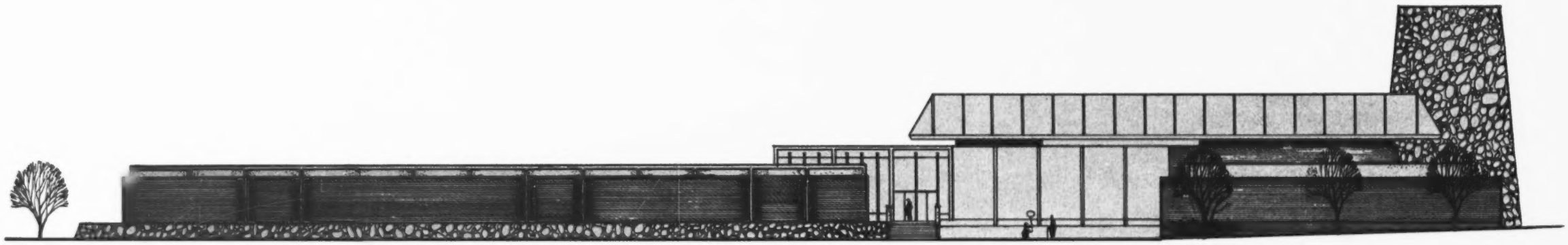
Most of the shelter has been provided in below-ground areas. However, some spaces face onto an open court which is depressed below grade. This was achieved by limiting the field of contamination and by blocking the ground direct by pool curbing and slightly raising the floor above the court.



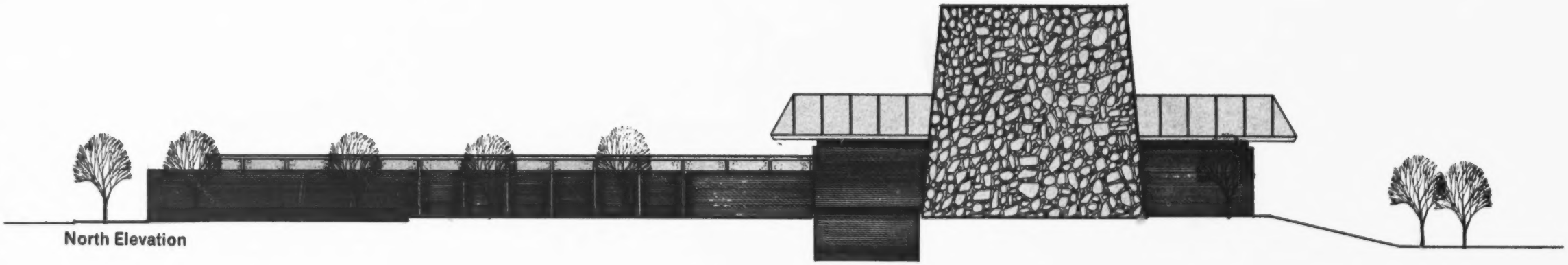
Site Plan



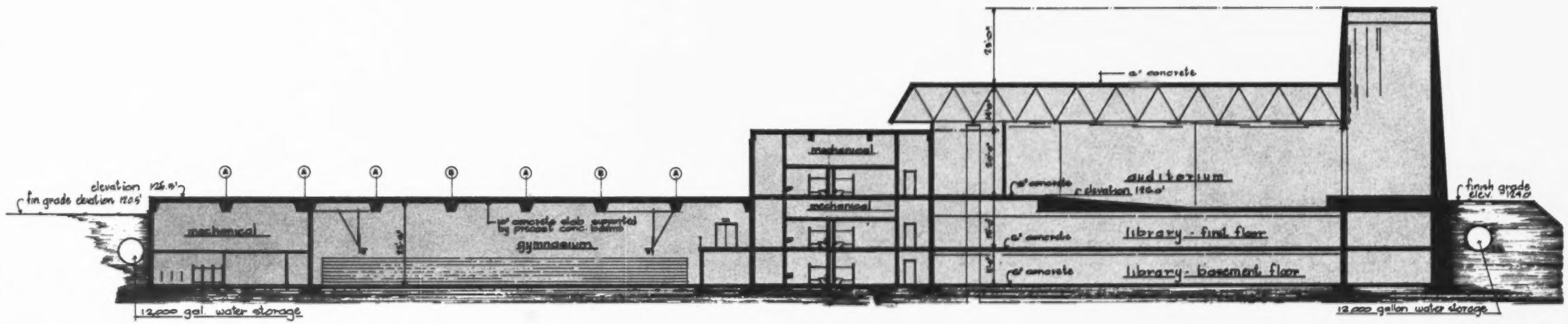
Interior Perspective



East Elevation



North Elevation



Longitudinal Section

Region 3
SECOND PRIZE

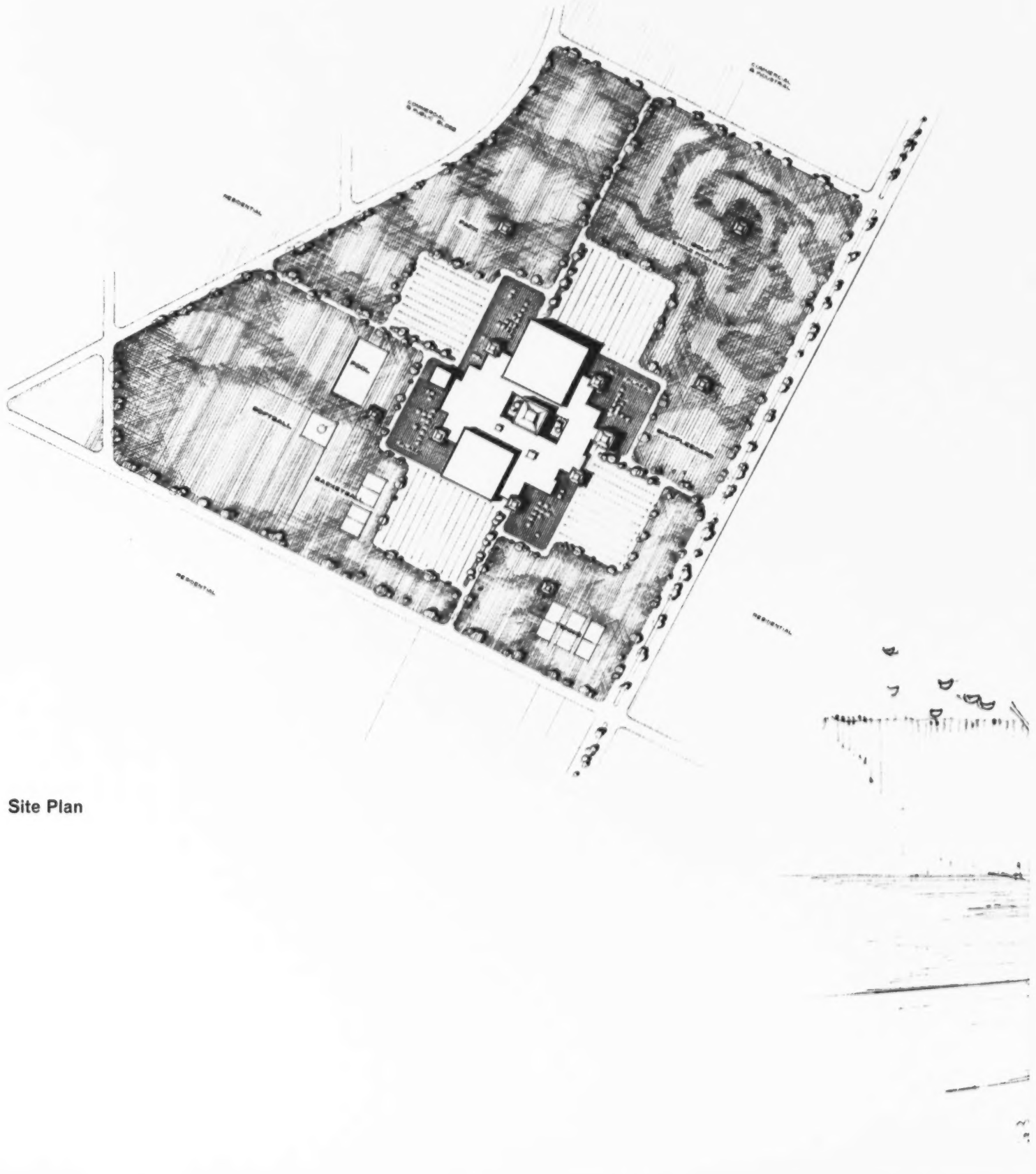
Francis E. Telesca, AIA, *Architect*
Greenleaf/Telesca
Miami, Florida

Team Members
Raul Llorente, *Designer*
Bertram S. Warshaw, *Fallout Shelter Analyst*

Well suited to a southern Florida site, the design presents a mixture of open and closed spaces. Parking is well distributed and vehicular and pedestrian access is direct and convenient. The "village" character of the center is highly appropriate. The varying roof levels and forms not only serve functionally but provide visual accents that lend interest. Despite the general quality of openness, there is abundant closure and protection from the natural environment, and shielding has been sensitively achieved.

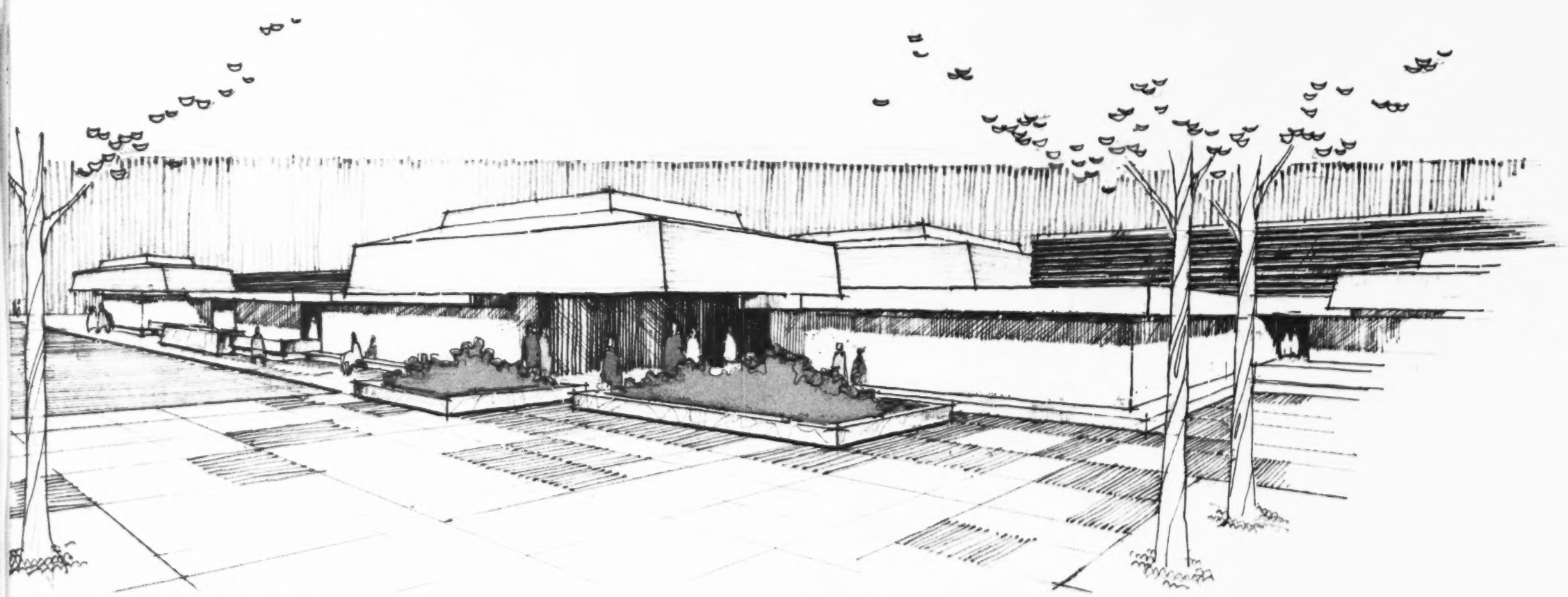
Analyst Comment

Fallout shelter is provided throughout all covered portions of the complex. Ground direct radiation was reduced by raising the entire complex above the field of contamination. Effective use is made of benches, planters and pools to reduce the contribution from the mall. Expanses of glass are then allowed to open to this interior feature. In general, geometry has been effectively used to shield all shelter entrances.

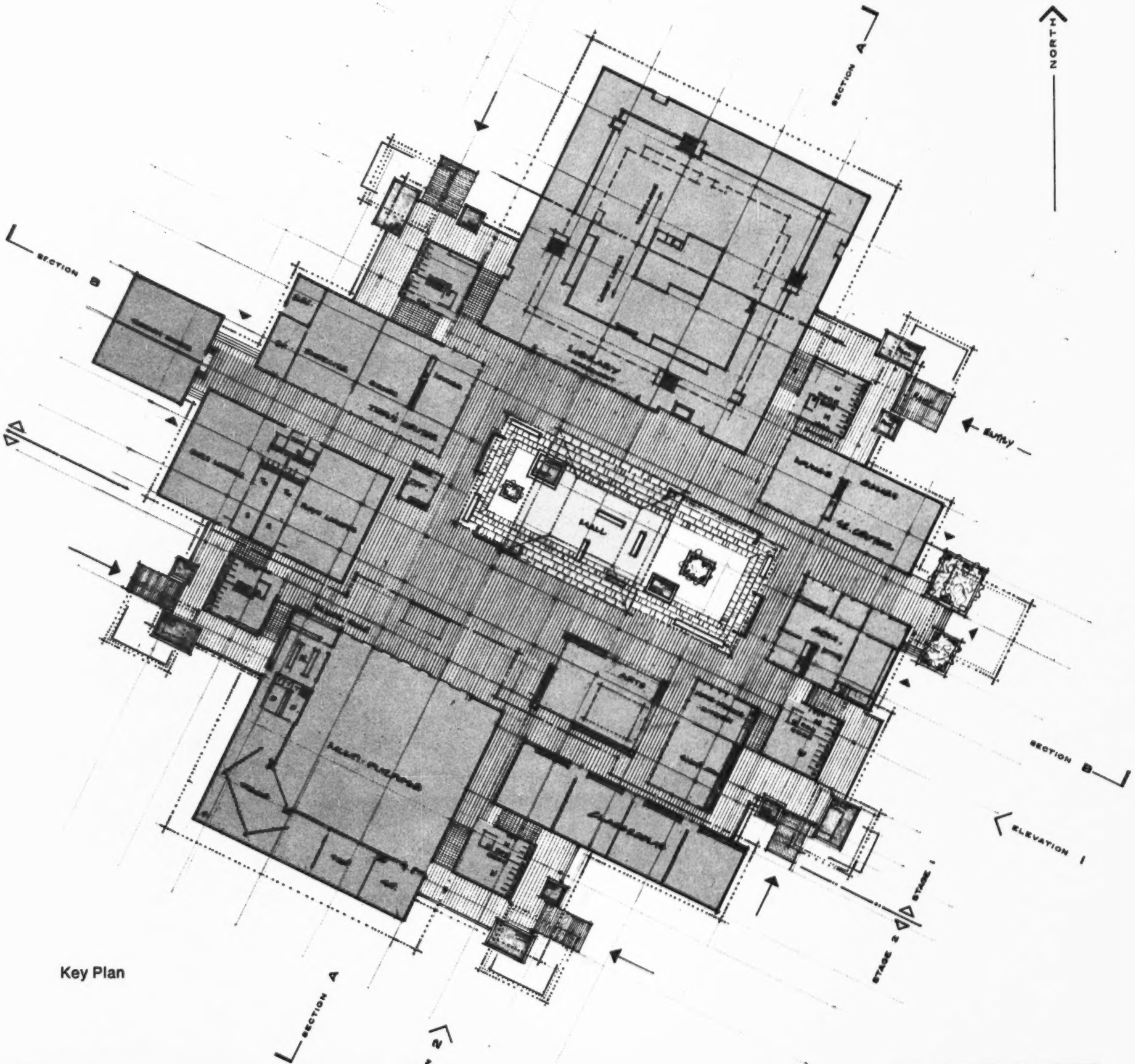


Site Plan

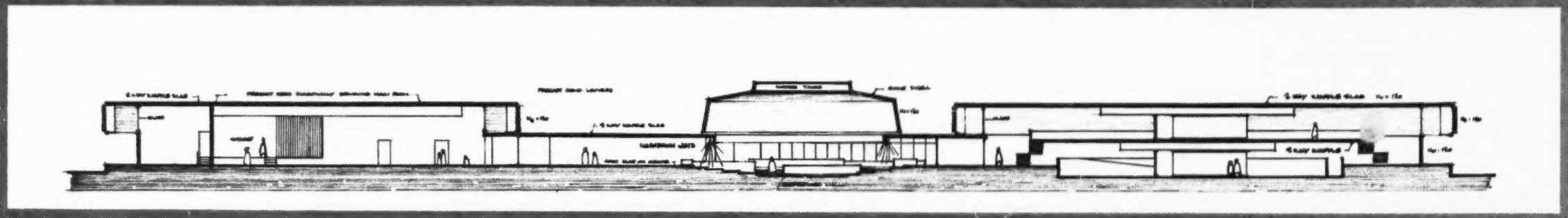
Interior Perspective



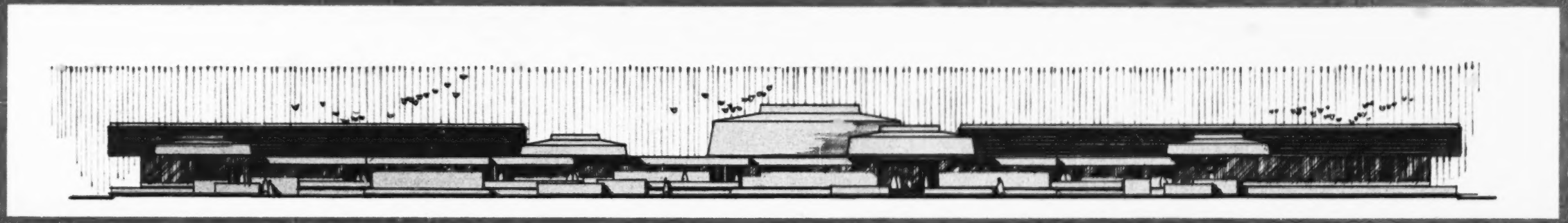
Perspective from East Plaza


NORTH
SECTION A
SECTION B
ENTRY
SECTION B
ELEVATION 1
STAGE 1
STAGE 2
SECTION A
SECTION 2

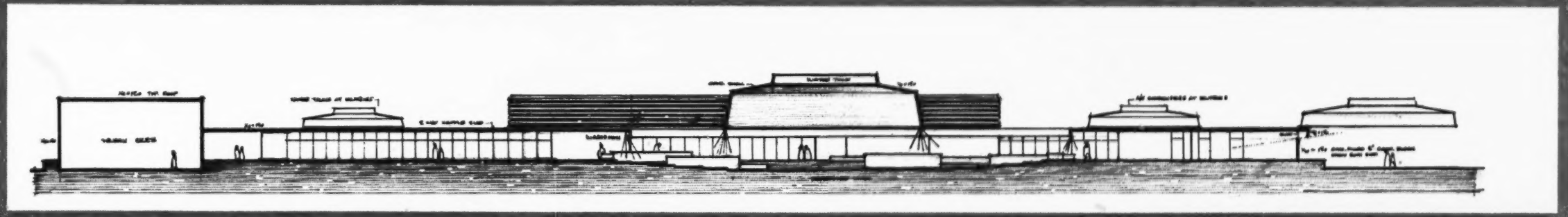
Key Plan



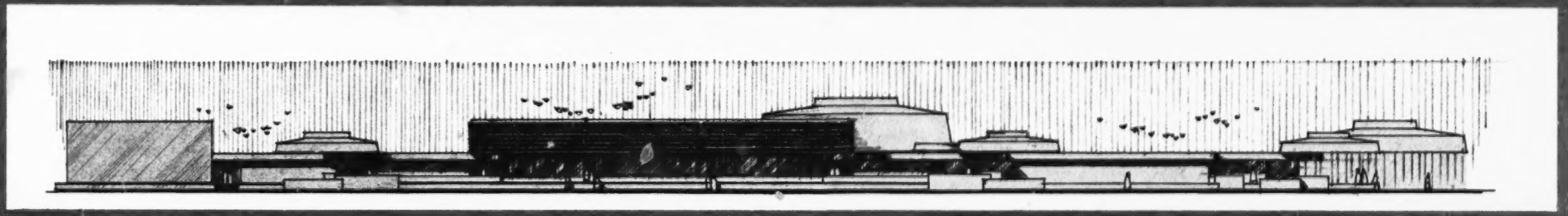
Section A



Elevation 1



Section B



Elevation 2

Region 4
FIRST PRIZE

James Cowgill, *Architect*
Minneapolis, Minnesota

Team Members
Timothy Stone, *Architect*
John T. Hanley, Ph.D., *Engineer and Fallout Shelter Analyst*

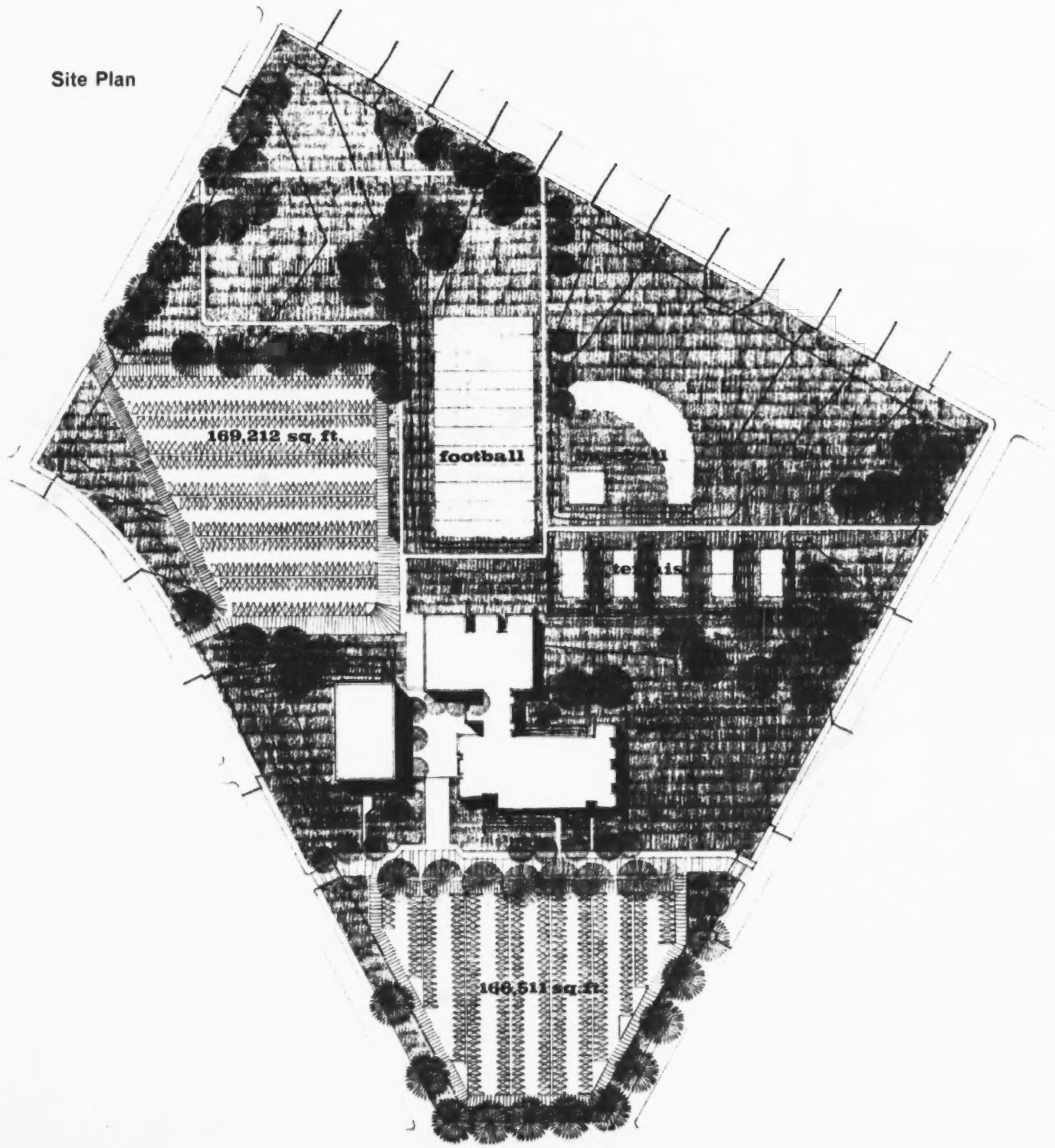
Jury Comment

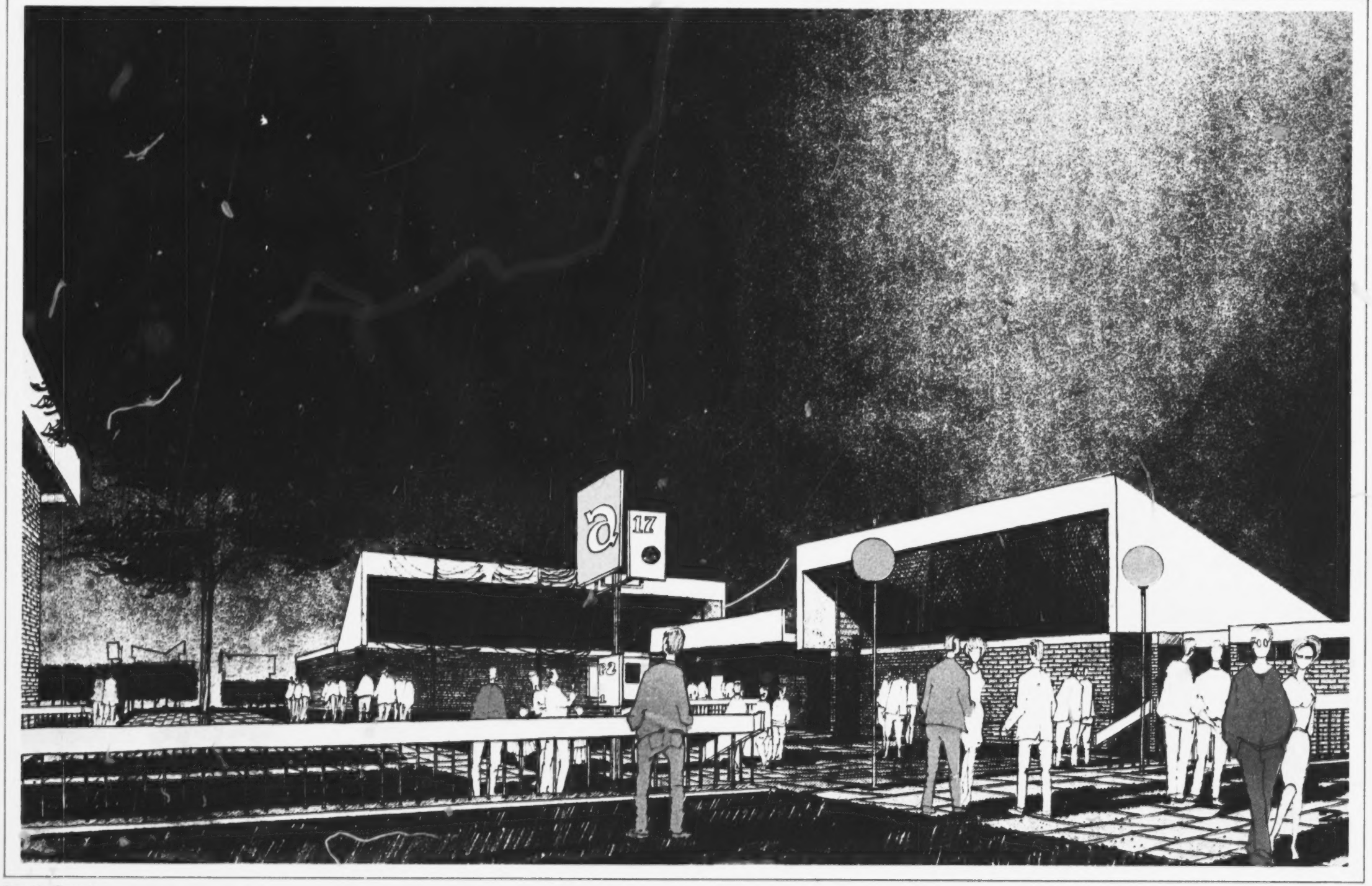
The site is well developed and parking is distributed to provide convenient access to the center without impinging on the buildings. The separate elements are well related functionally and visually. Both character and unity are provided in the composition by the repetitive use of strong, sloping roof forms, and interest is added by the use of contrasting materials for the supporting walls. The plans of the individual elements are well organized and there is a structural integrity throughout.

Analyst Comment

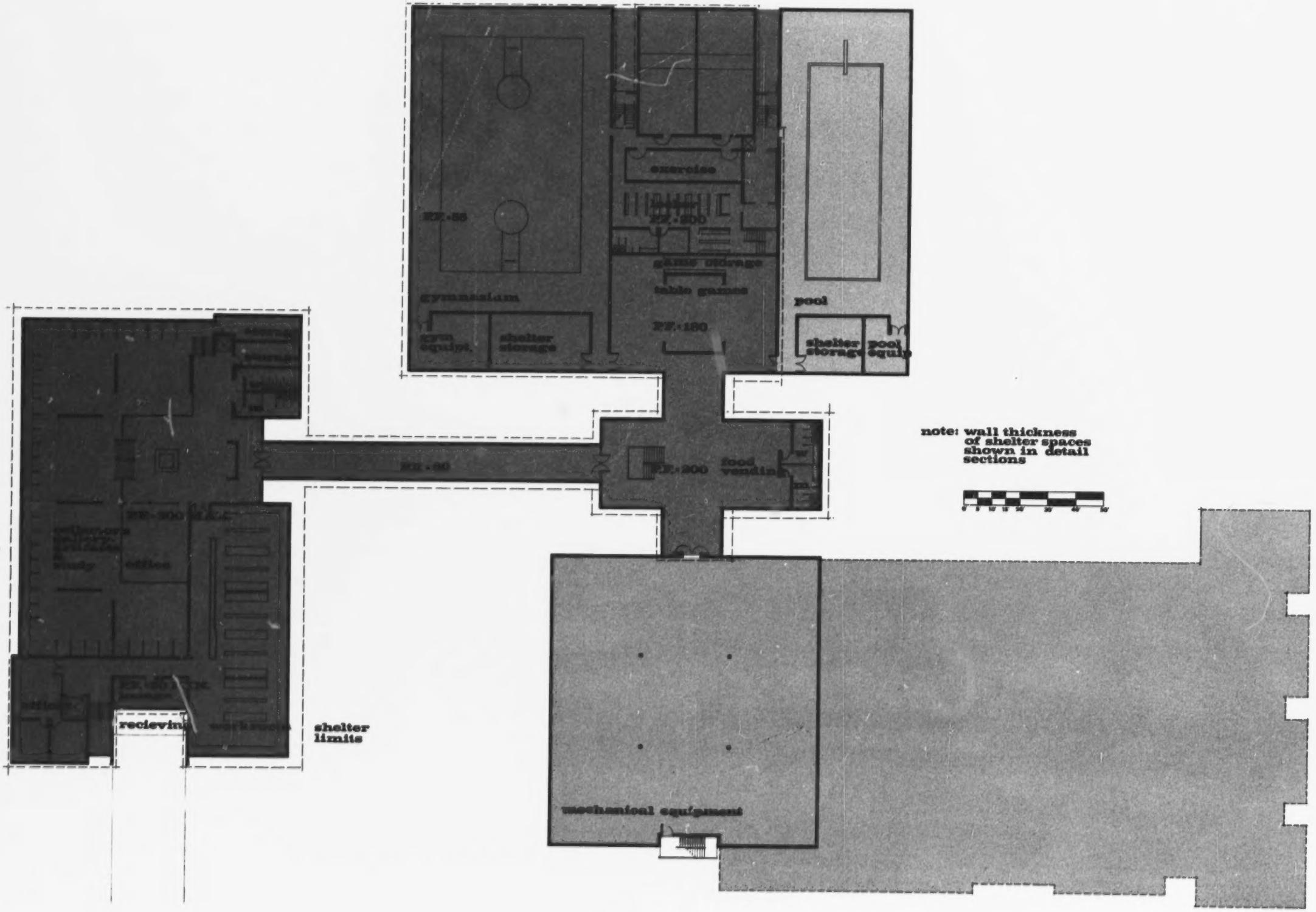
Shelter space is achieved through utilizing the inherent advantages of multistory construction and the natural slope of the site. The basement area in the library provides a shelter with PF 300. No additional mass thicknesses were needed to achieve this level of protection over those required for structural considerations. The PF in the gymnasium and multipurpose room is achieved by adding mass to the overhead construction. This solution is a simple, direct approach illustrating that fallout protection can be achieved without undue expense. The kitchen and storage areas adjacent to the multistory room could have been included in the shelter space by slight modifications.

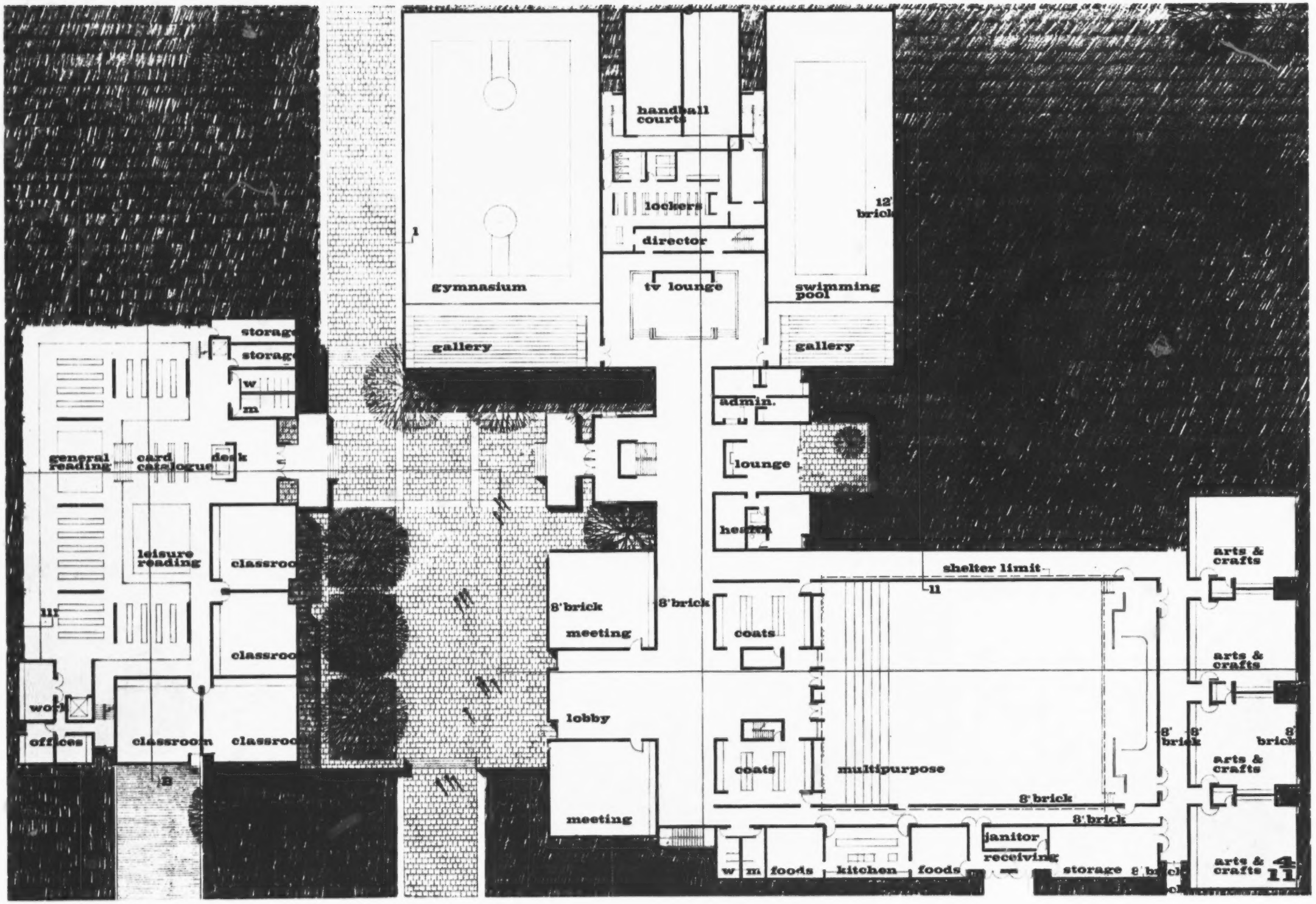
Site Plan

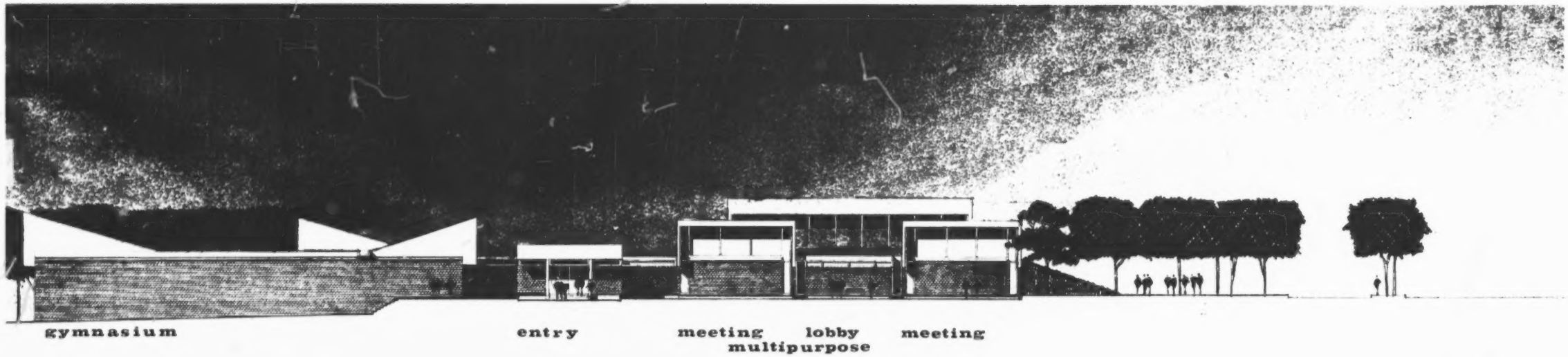




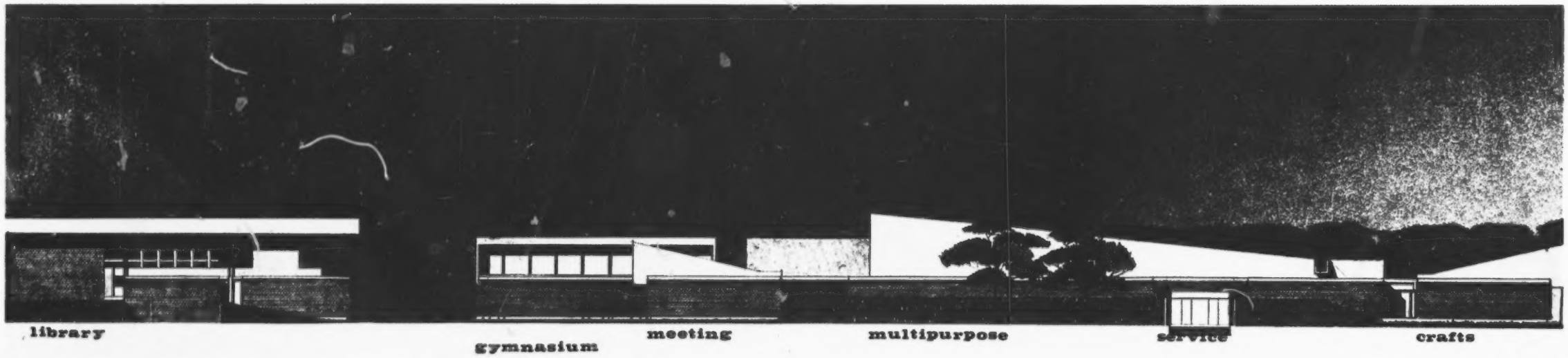
South Court


exercise
gymnasium
gym equipt.
shelter storage
game storage
table games
pool
shelter storage
pool equip
food vending
office
recieving
shelter limits
mechanical equipment
note: wall thickness of shelter spaces shown in detail sections

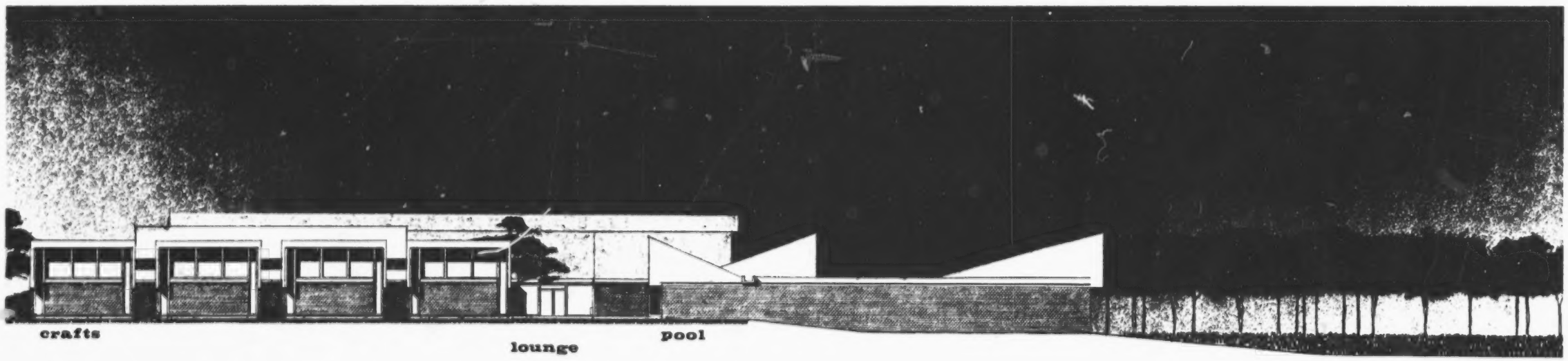

handball courts
lockers
director
gymnasium
tv lounge
swimming pool
gallery
gallery
admin.
lounge
storage
storage
w
m
general reading
card catalogue
desk
leisure reading
classroom
classroom
classroom
classroom
offices
shelter limit
11
8' brick
meeting
8' brick
coats
arts & crafts
arts & crafts
arts & crafts
arts & crafts
lobby
coats
multipurpose
8' brick
8' brick
meeting
janitor
receiving
w
m
foods
kitchen
foods
storage
4
11



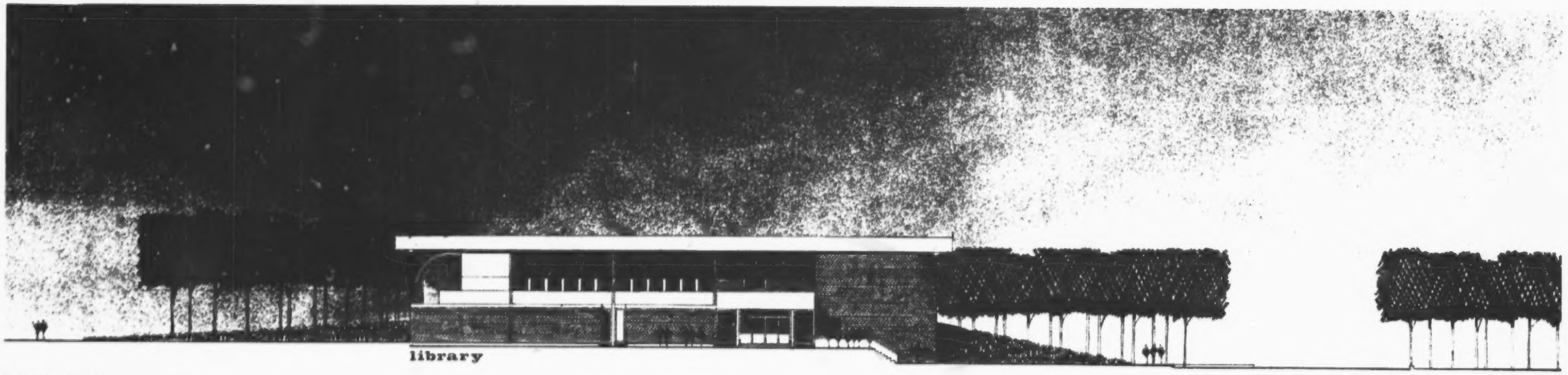
North Court



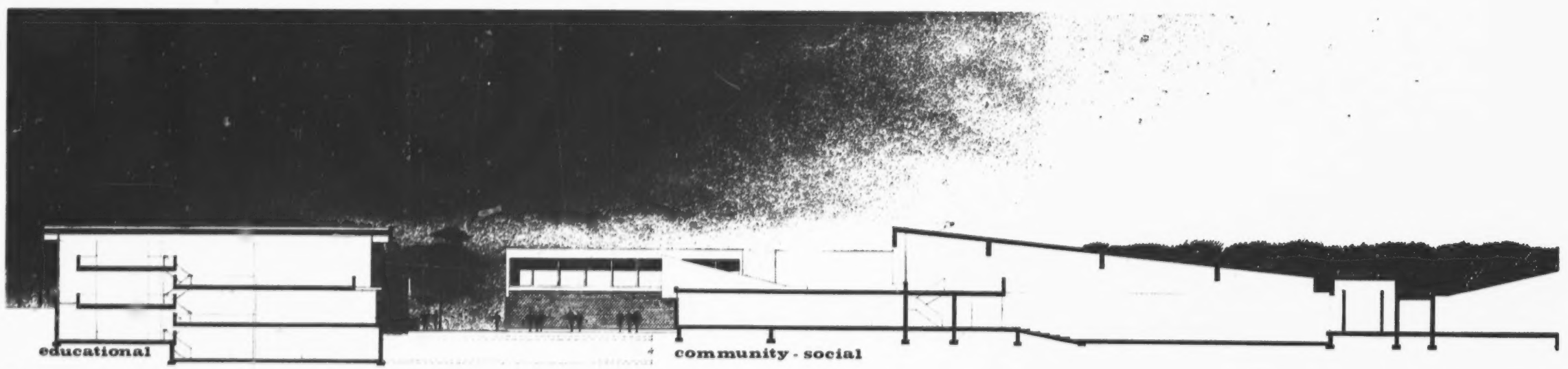
West Elevation



South Elevation



South Court



Section

Region 4

THIRD PRIZE

Robert A. Hopewell, *Architect*
Gary, Indiana

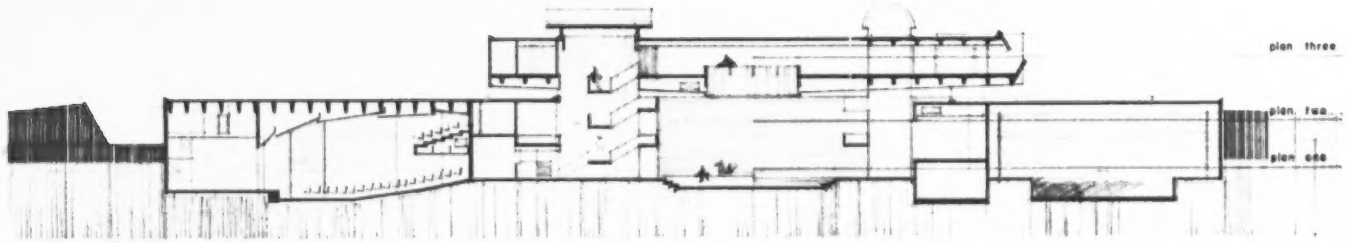
Team Member
William H. Land, *Engineer and Fallout Shelter Analyst*

Jury Comment

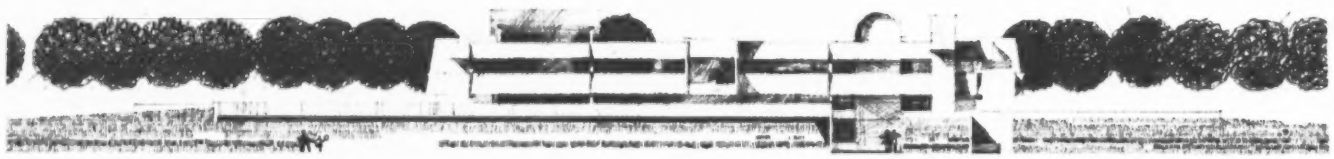
This entry presented an imaginative development of site. Parking is distributed on two sides in a linear fashion, paralleling the streets, with a concentration of parking at the north and away from adjacent residential areas. Location of the building at the center of the site permits use of sloping earth berms for shelter protection, as well as adding a landscape and foreground for the highly sculptured building forms. The grouping of the four major elements around a central lobby-lounge space is well organized and provides ready access from the outside to all activities.

Analyst Comment

Protection is achieved geometrically in the central lobby-lounge area by wrapping this core with four major elements—theater, gymnasium, pool and library—and covering it with the art, music and meeting rooms. Protection is increased by placing concrete baffles at each of the four main entrances. Berms permit a moderate degree of openness around the building. The required degree of shielding could have been provided with berms of lesser height.

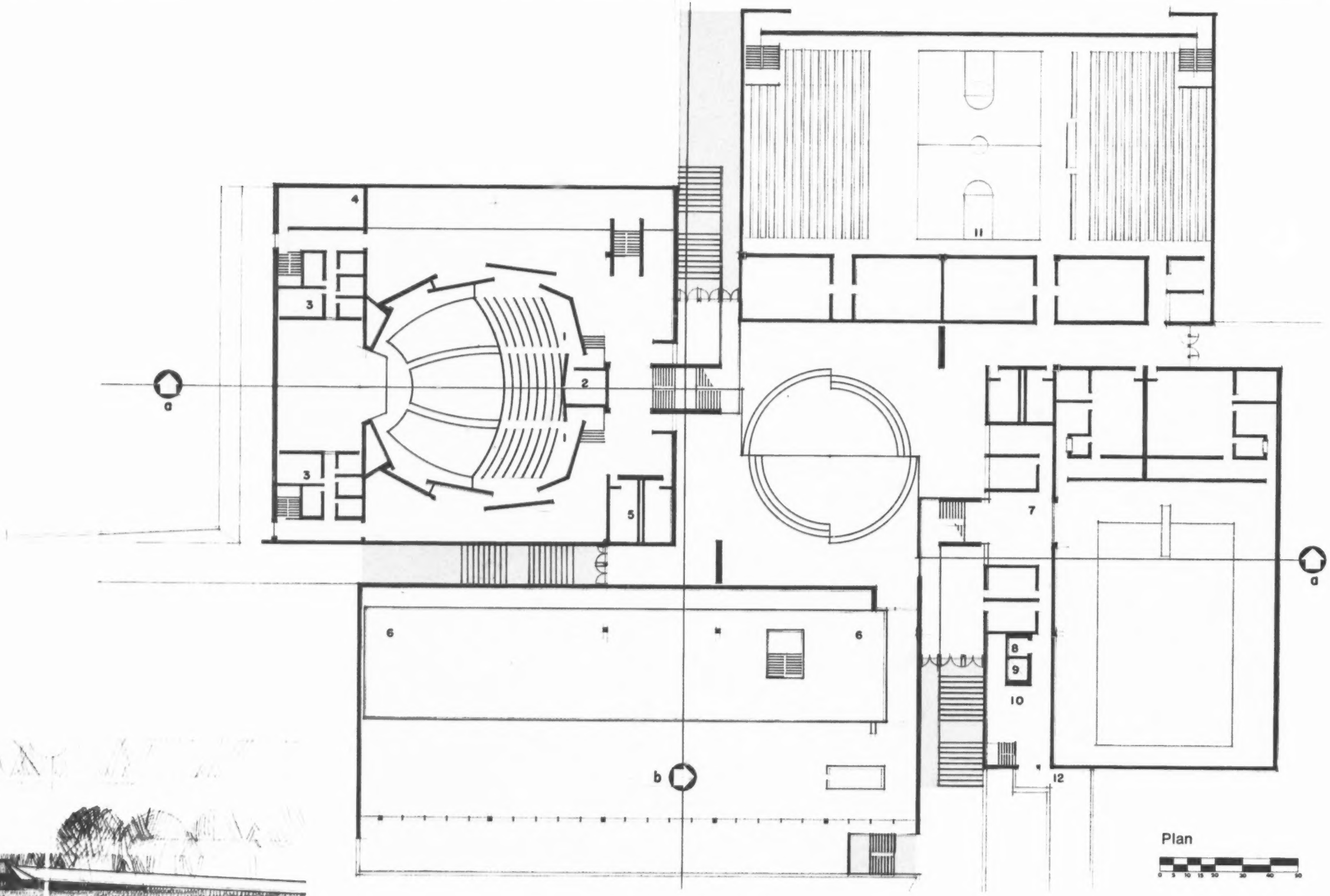


Section A



South Elevation

Exterior Perspective



4
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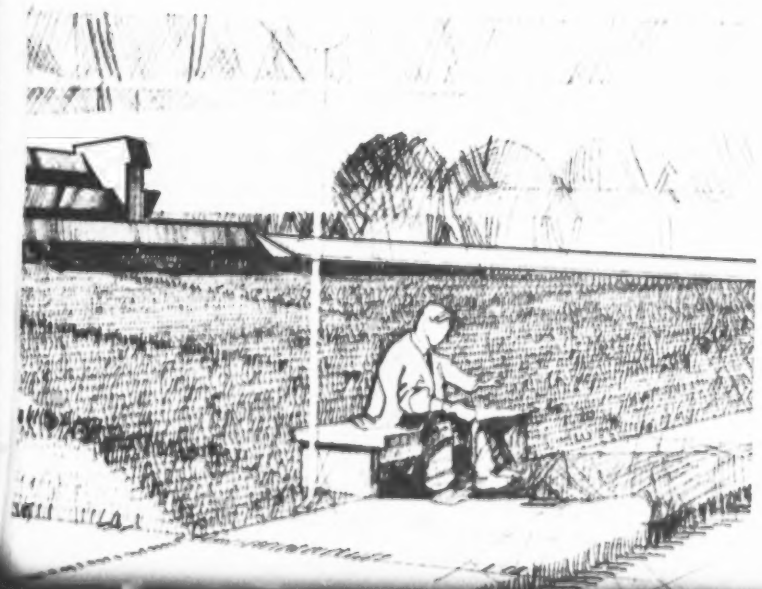
10
11
12
a
a
b
Plan
0 5 10 15 20 30 40 50



Region 4

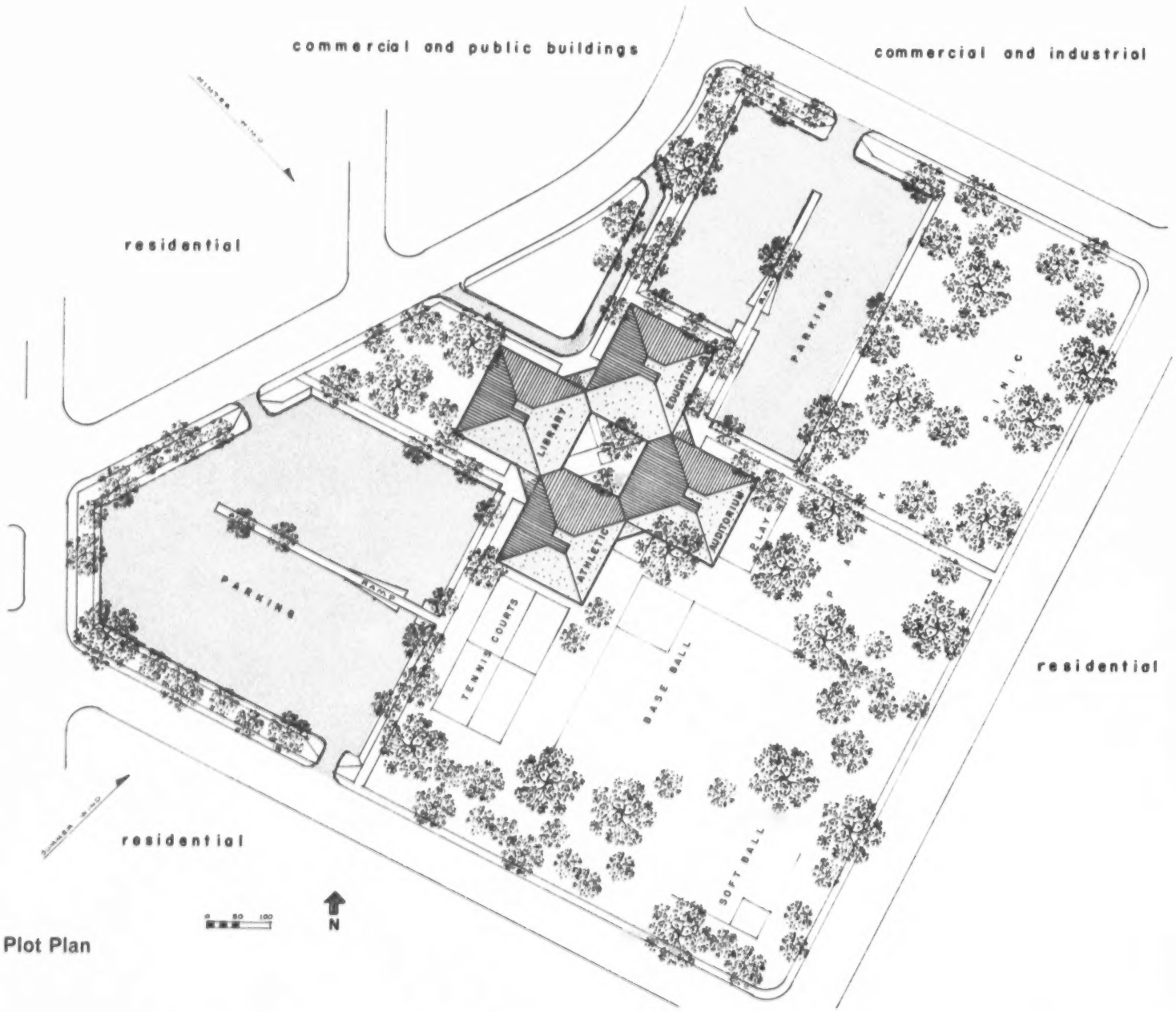
CERTIFICATE OF MERIT

Edward L. Verkler, AIA, *Architect*
Urbana, Illinois
Department of Architecture and Allied Arts
Texas Technological College
Lubbock, Texas

Team Member
J. Raymond Carroll, *Engineer and Fallout Shelter Analyst*

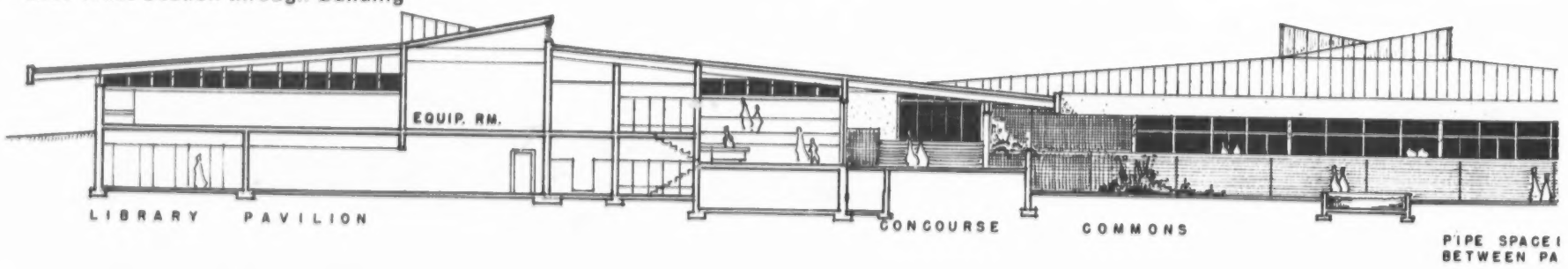
The site development is logical but might have been more interesting. Parking is concentrated in two major lots using two of the four corners of the site and impinging on two of the four sides of the complex. The arrangement of the four major elements around a central commons area provides convenient access, but the repetition of forms and the symmetry of the composition appear forced. The individual elements are well conceived and developed in an imaginative fashion.

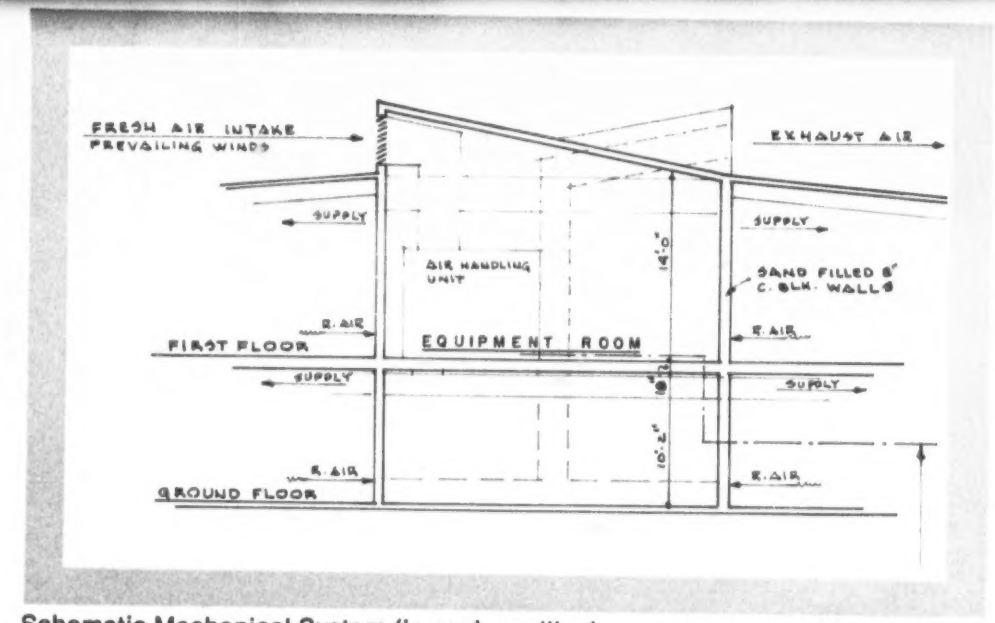
Shelter is provided in the educational and library pavilion basements and in partial basements of the athletic pavilion and auditorium. Water for emergency use is provided to all spaces from the pool by adding a small pump and extending lines to all areas thru the connecting pipe tunnels. Good shelter utilization was achieved in this dual-use space.



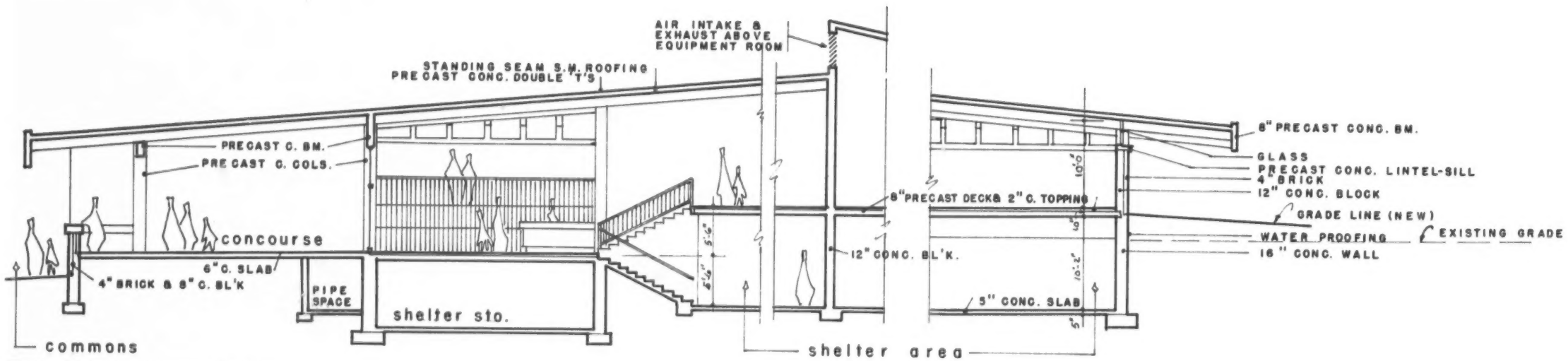
Plot Plan

East-West Section through Building

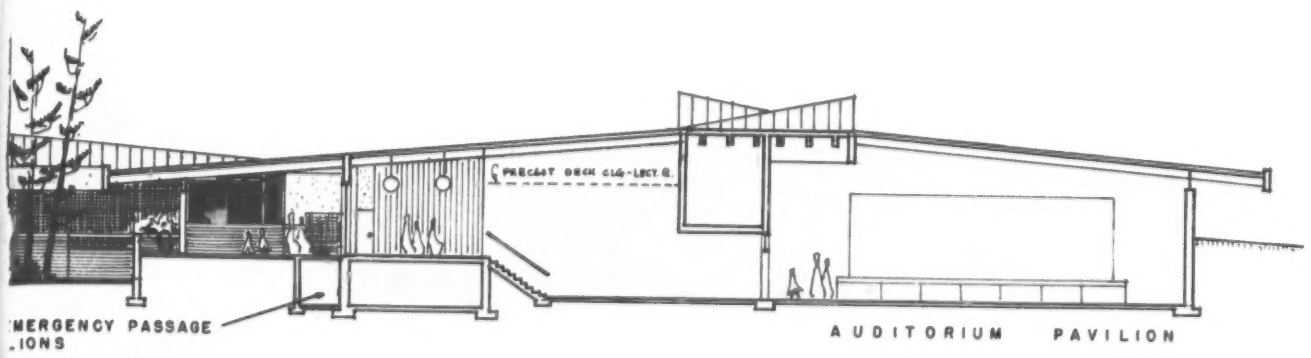




Schematic Mechanical System (in each pavilion)



Typical Section through Pavilion



Region 6

SECOND PRIZE

Thaddeus M. Janowski, *Associate Professor*
Arthur E. Burton, *Associate Professor*
Architect, Engineer
and Fallout Shelter Analyst
Department of Architecture
Iowa State University
Ames, Iowa

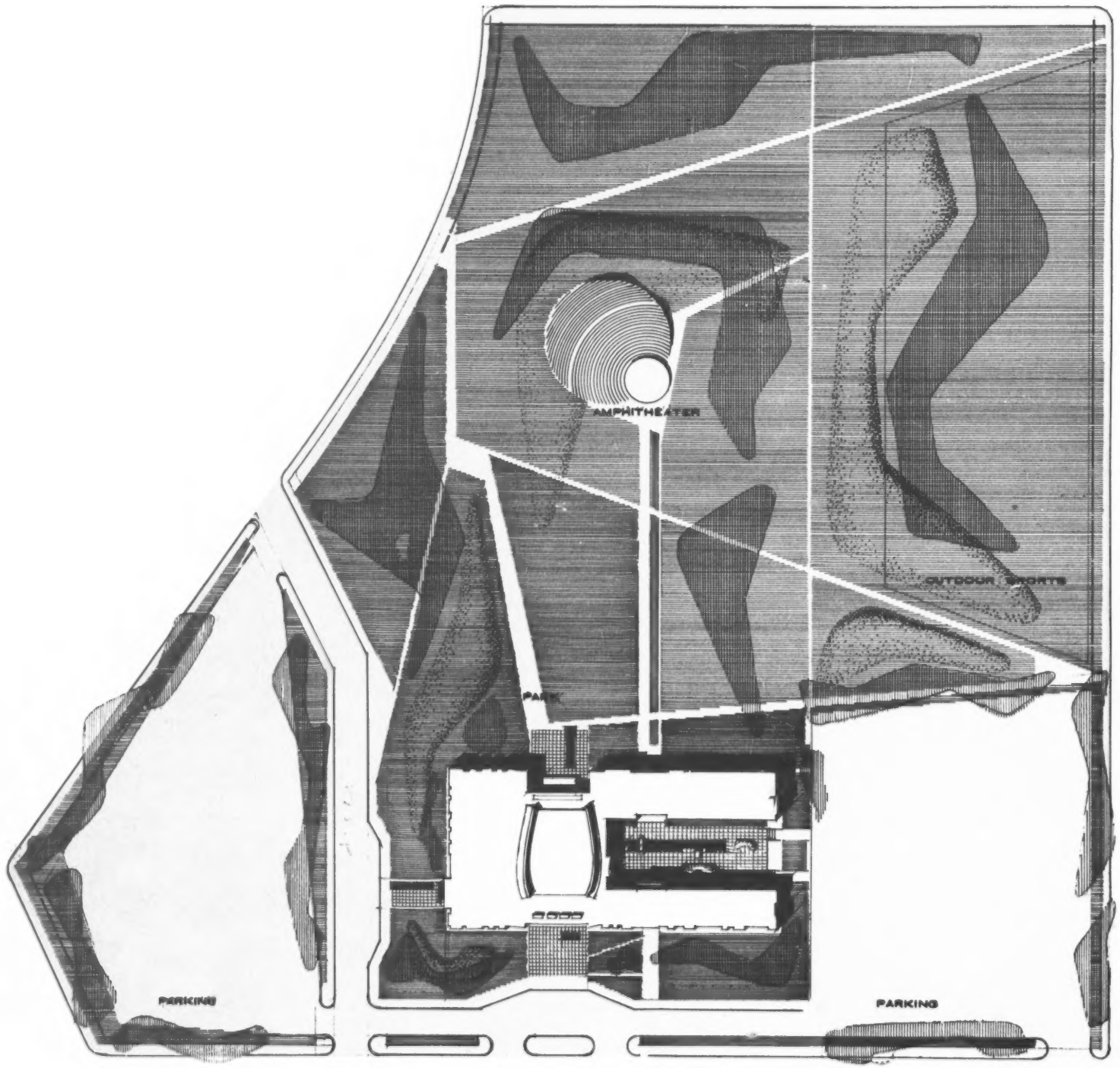
Team Member
Douglas A. Frey

Jury Comment

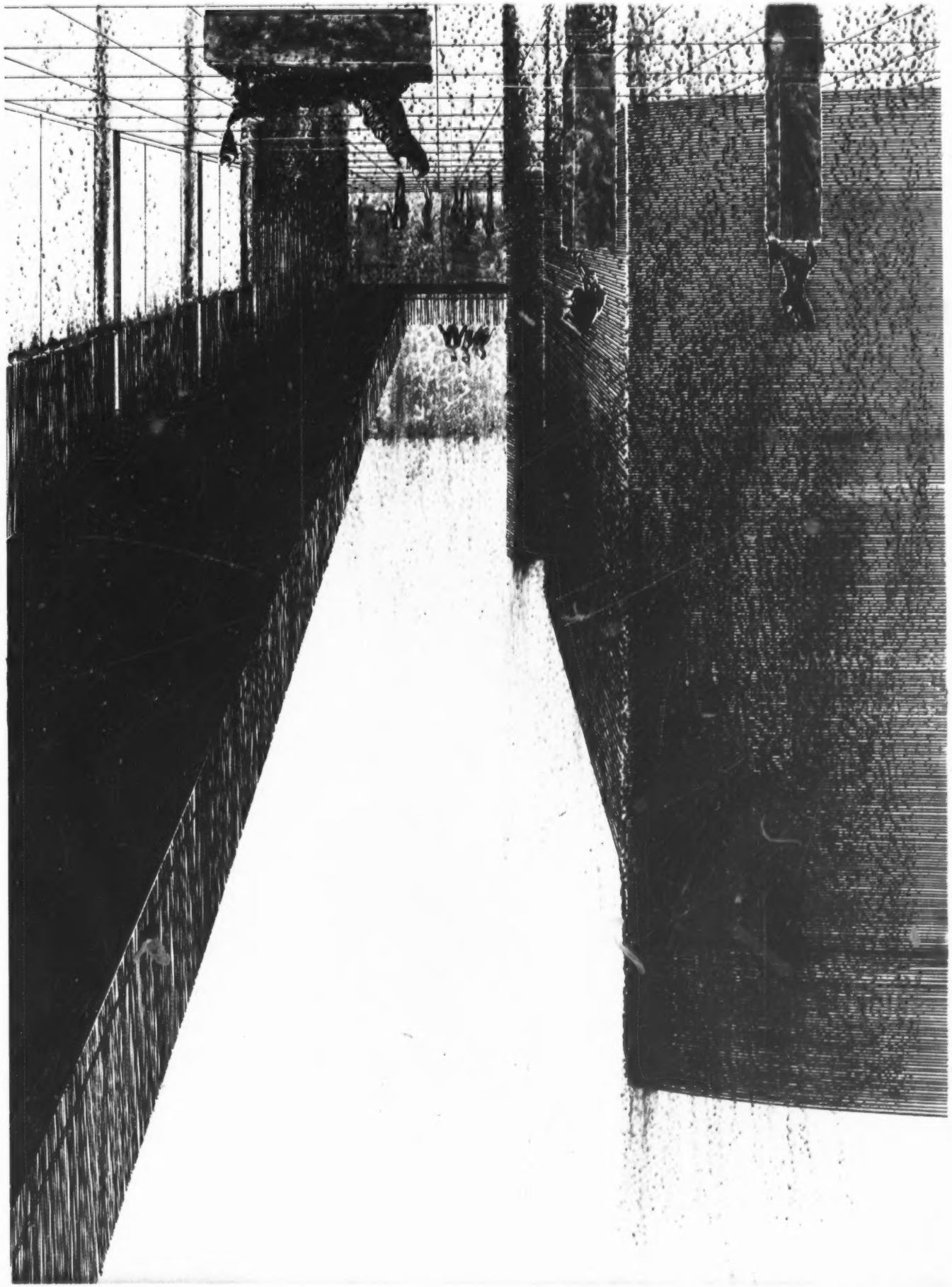
The rationale of the site development is imaginative but unclear. The two major parking lots are placed nearest the residential areas, and access to the lots is in two instances at or near the intersection of the residential streets, introducing unnecessary driving hazards. Access to the complex is convenient, and circulation is generally well organized except between the gymnasium and the other activities. Egress from the second floor, particularly from the auditorium balcony, appears inadequate. The variety of spaces and forms employed adds considerable interest to the overall composition, but at some sacrifice of unity and character generally associated with a community center.

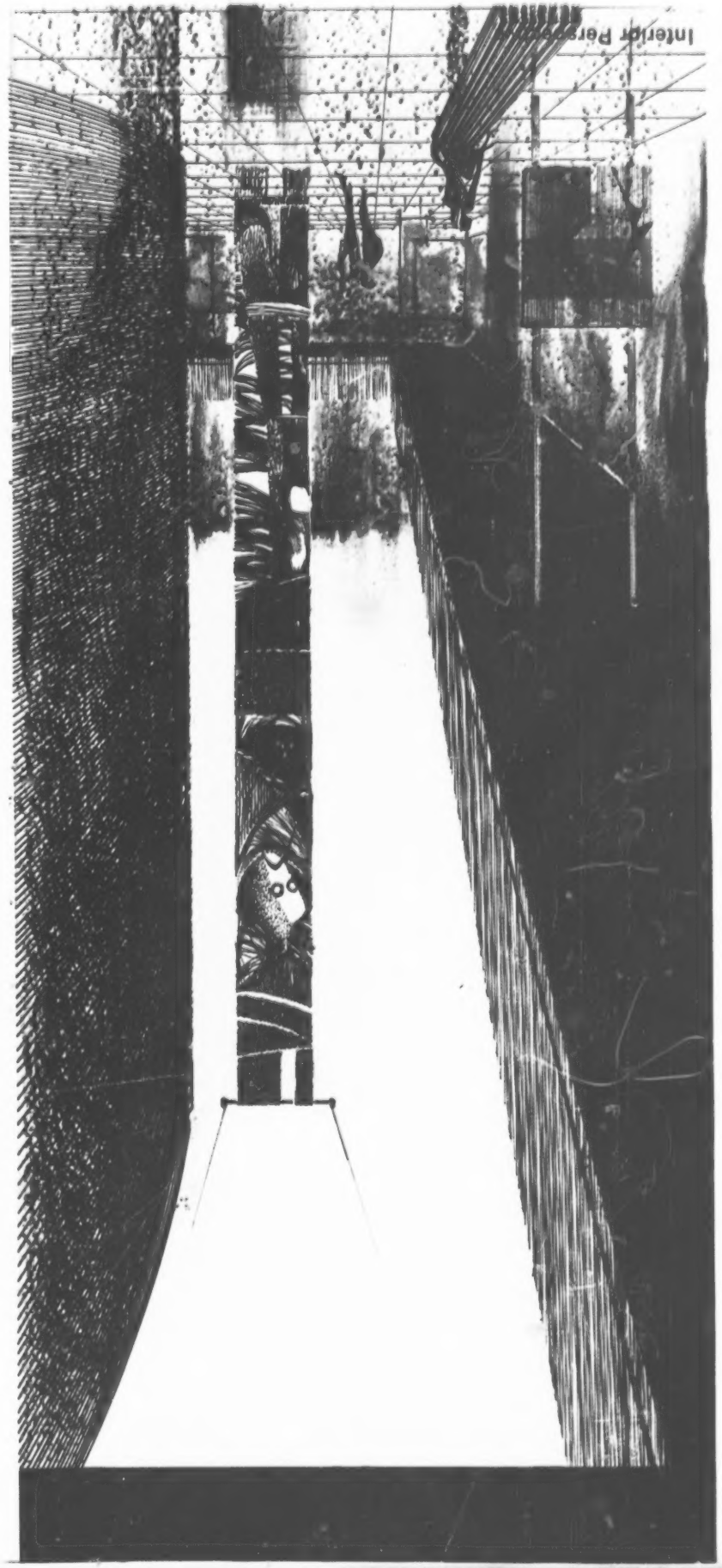
Analyst Comment

In the first phase, shelter is located in the auditorium and gallery and the space below. The level of protection in these spaces is improved with the addition of buildings in each construction phase. The entrances are well shielded, although seemingly open. With minor modifications additional spaces could have been provided in the library—second phase. In the fourth phase, shelter is provided below grade under the gymnasium.



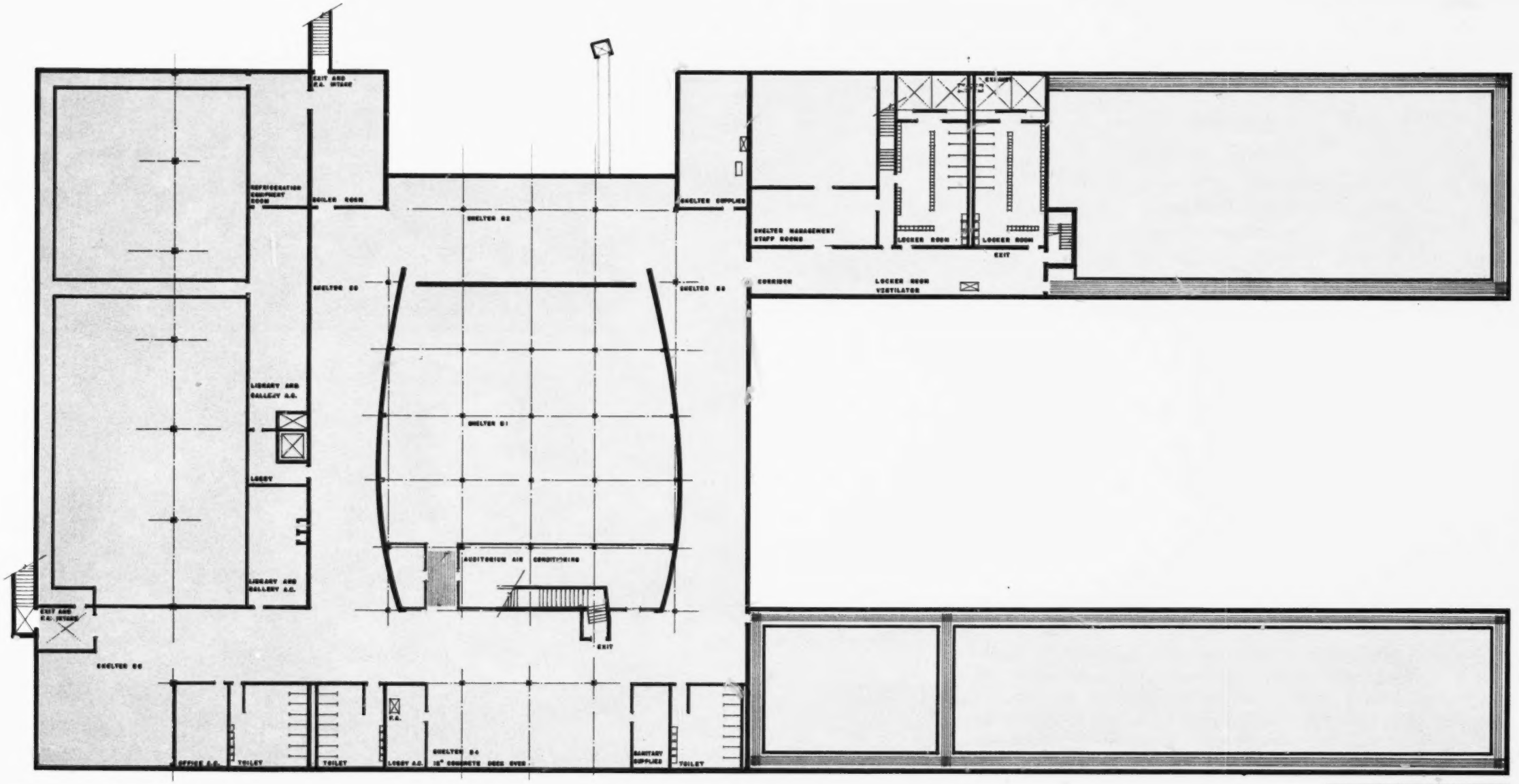
Site Plan



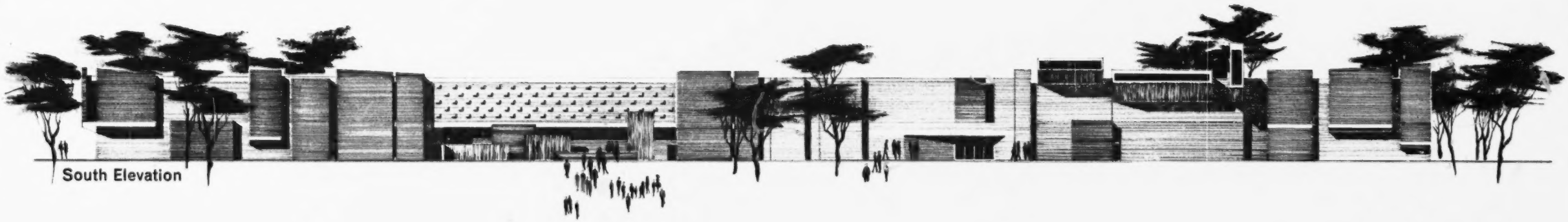


Interior Perspective

AUDIO VISUAL
LANGUAGE LABS
STORAGE
REFERENCE ROOM
MAP ROOM
MAGAZINE
DUCTS
OFFICE
ELEV.
CATALOG
MAIN READING ROOM
TEL.
CHECK
LOBBY & ART GALLERY
CHILDREN'S ROOM
(FUNCTIONS SECONDARILY
AS DECONTAMINATION
FACILITY
OFFICE
UP
TOILET
TOILET
TOILET
FOYER AND ART GALLERY
AUDITORIUM
DOWN
UP
FOYER & ART GALLERY
TEL.
FA
COAT ROOM
COAT ROOM
STORAGE
UP
NO. 1
NO. 2
NO. 3
HANDBALL COURTS
PING PONG
EQUIPMENT OFFICE
LOBBY
UP
GYMNASIUM
COURTYARD OUTDOOR EXHIBITION
LOBBY & ART GALLERY
TOILET
TOILET
TOILET
BOARD OF DIRECTORS
PRIVATE OFFICE
LOBBY
STAFF LOUNGE
SECRETARY
SCHOOL DIRECTOR'S OFFICE
SCHOOL AUDITORIUM



Basement Floor Plan



South Elevation

Region 7

SECOND PRIZE

S. Wayne Williams and Robert L. Wright
College of Architecture
University of Arizona
Tucson, Arizona

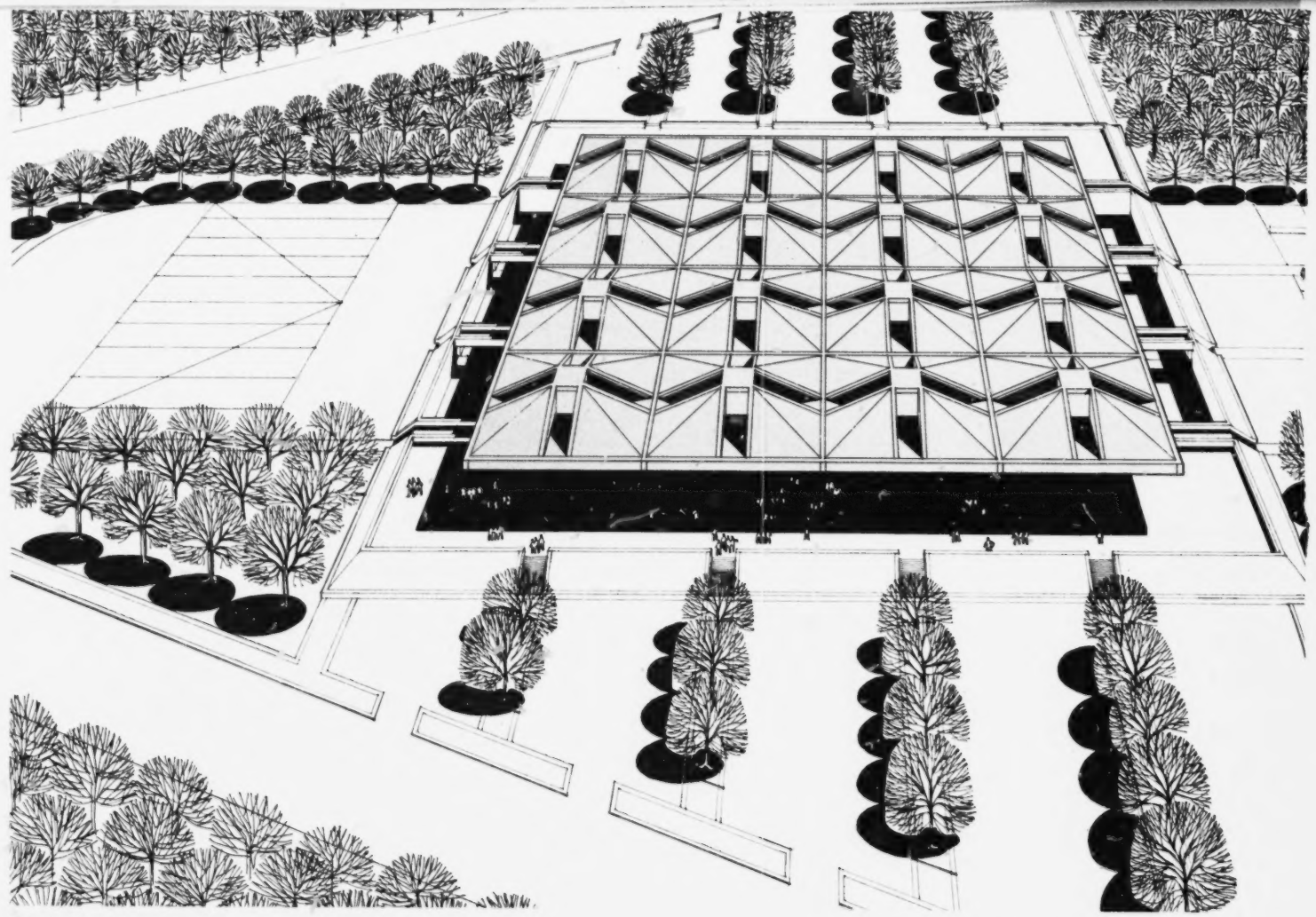
Team Members
John F. Campisano, *Engineer*
B. Gail Buckmaster
Fallout Shelter Analyst, Architect and Engineer

Jury Comment

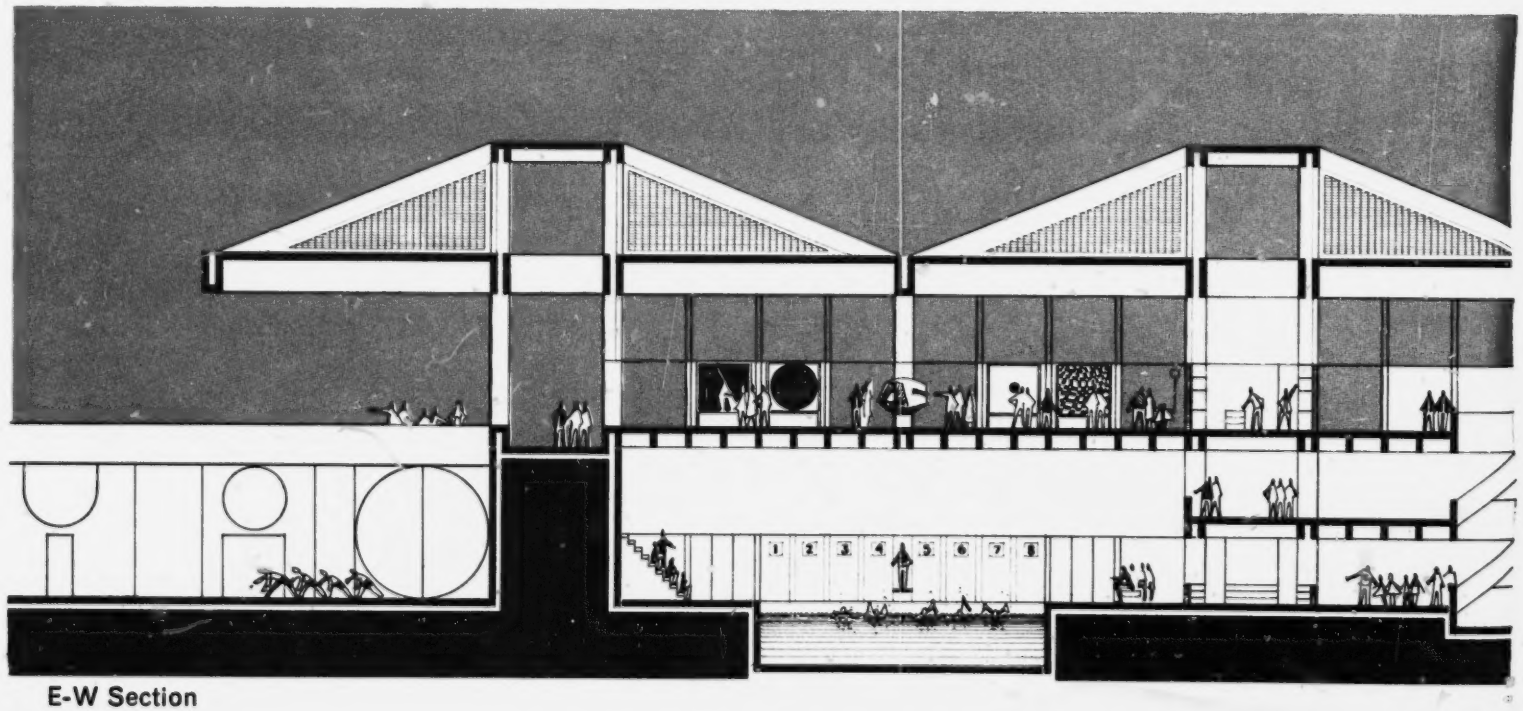
One of the boldest in concept, this submission has much to commend it. Highly unified, it nevertheless provides adequate separation of the different functions. Covered and open outdoor spaces are well related as well as suited to the region. The structural system is sensitively developed and lends character and interest to the complex without being overpowering. Although achieving a "village" atmosphere, the design retains a quality identified with "center"—a single place with a variety of activities available.

Analyst Comment

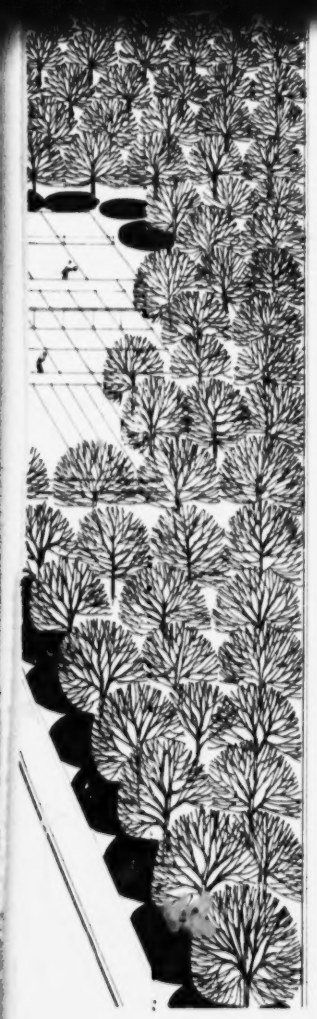
Shelter is located on all three levels of the building. Extensive overhangs and surrounding decks and courts essentially eliminate ground direct contribution, allowing an apparent openness to the upper level shelter. Dual-use is verified by extensive shelter use plans for each level taking into account the varying degrees of protection afforded by multistory construction.

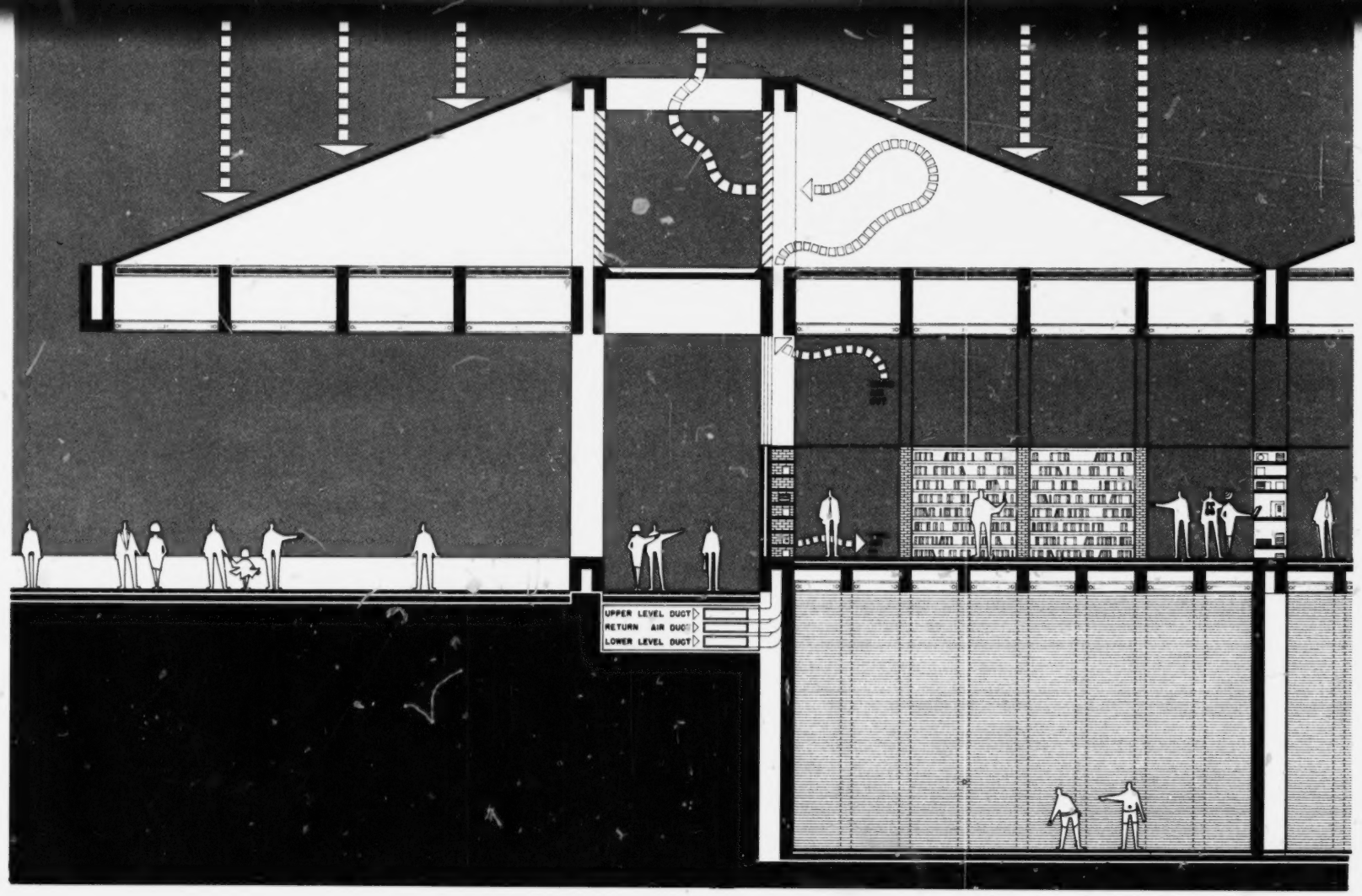


Birdseye Perspective

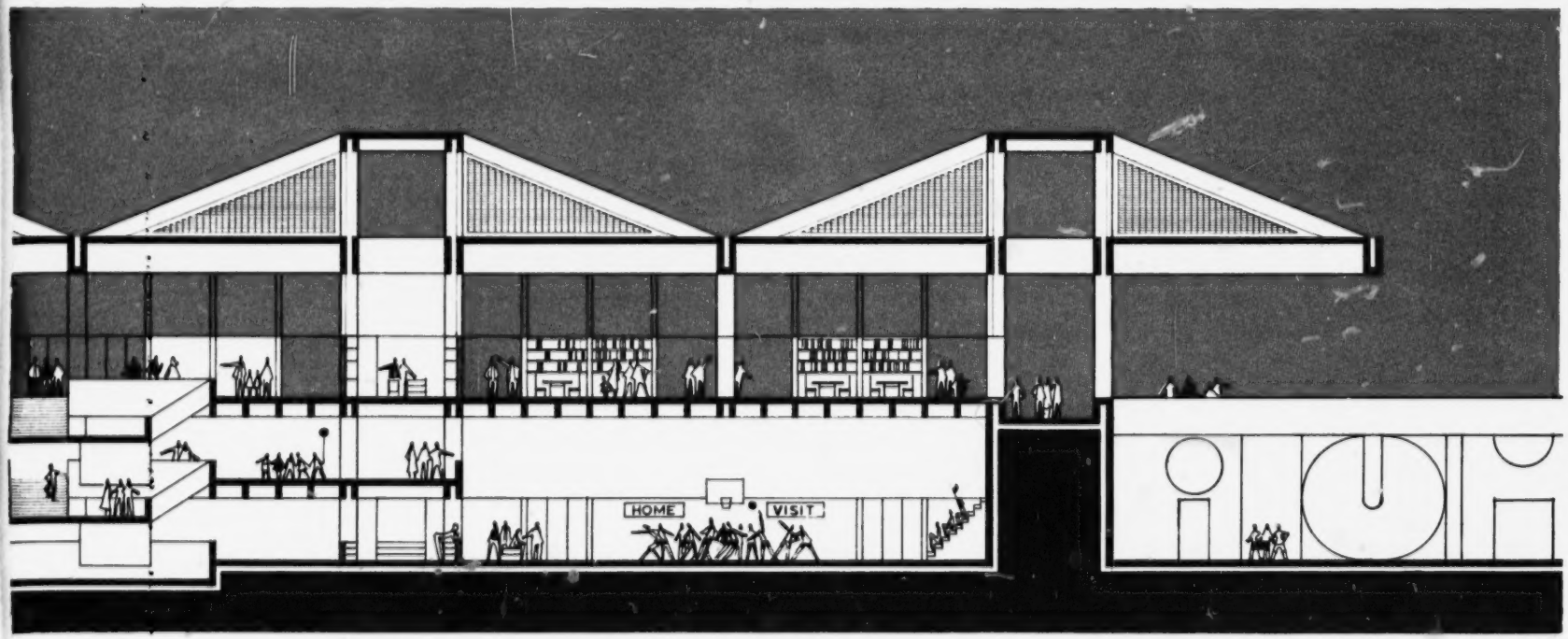


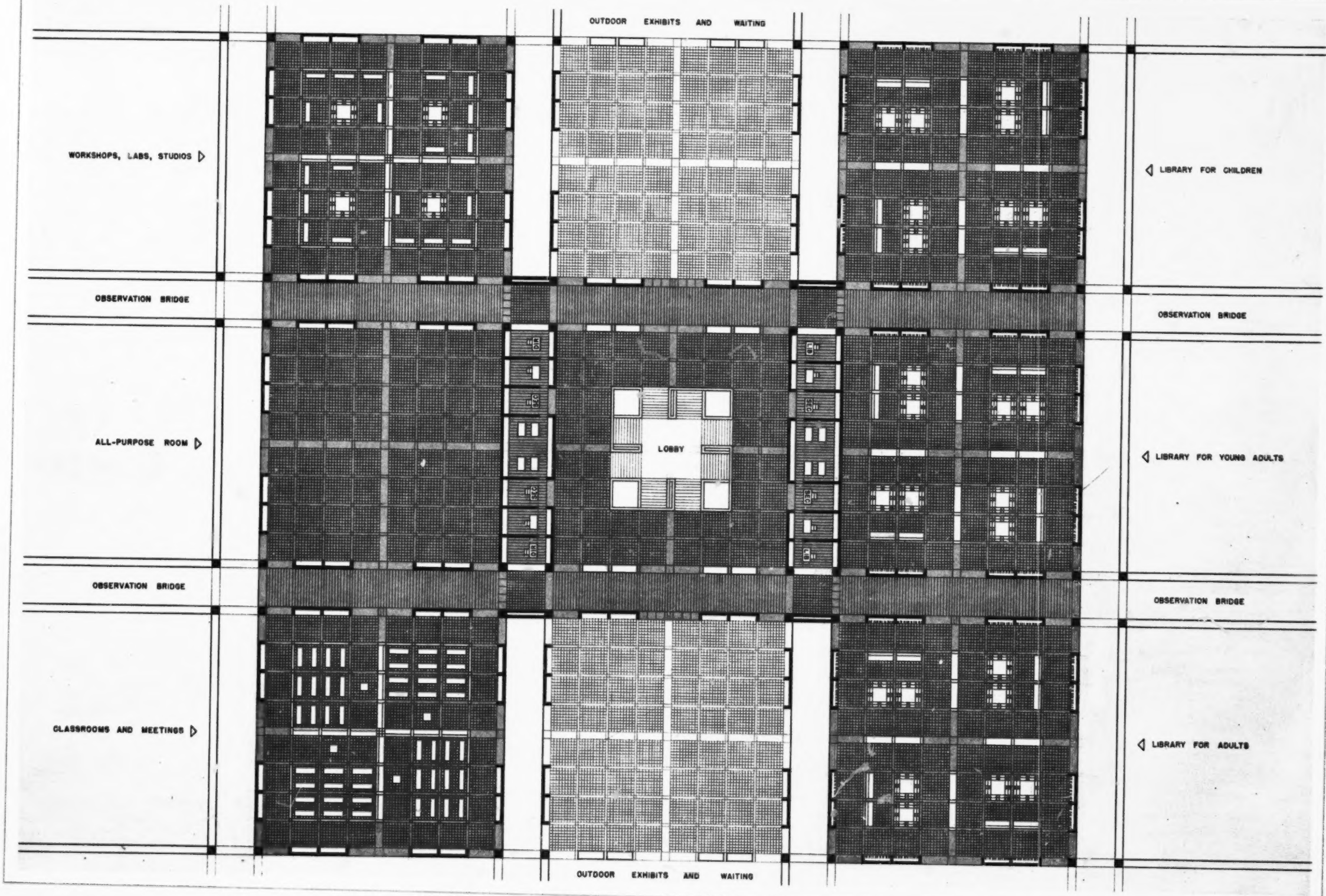
E-W Section



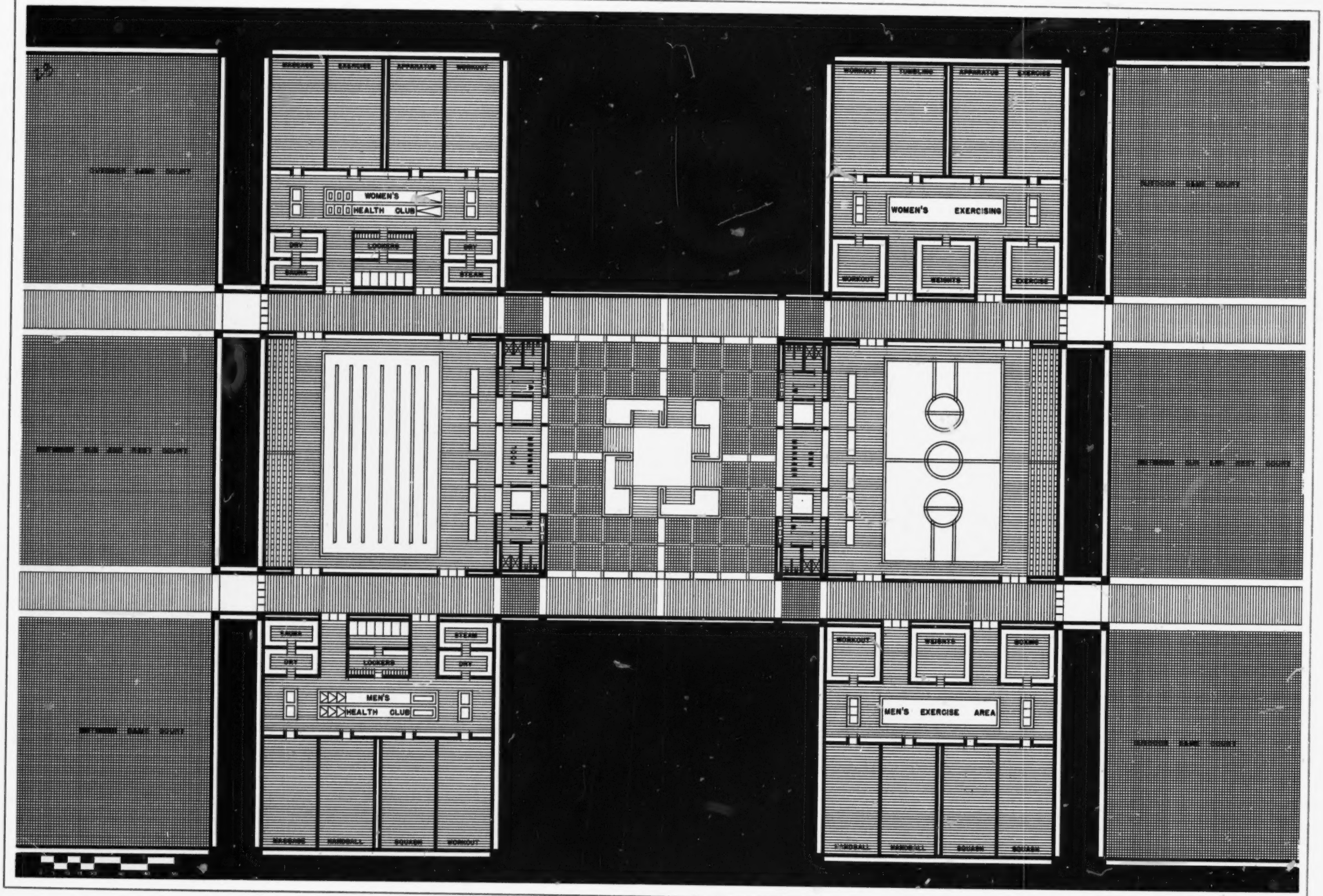


Partial Working Section





Plan—Cultural Level



Plan—Recreation Level

Region 7

CERTIFICATE OF MERIT

John Mario Gatto, AIA, *Architect*
The Nance Company
Palo Alto, California
Team Member

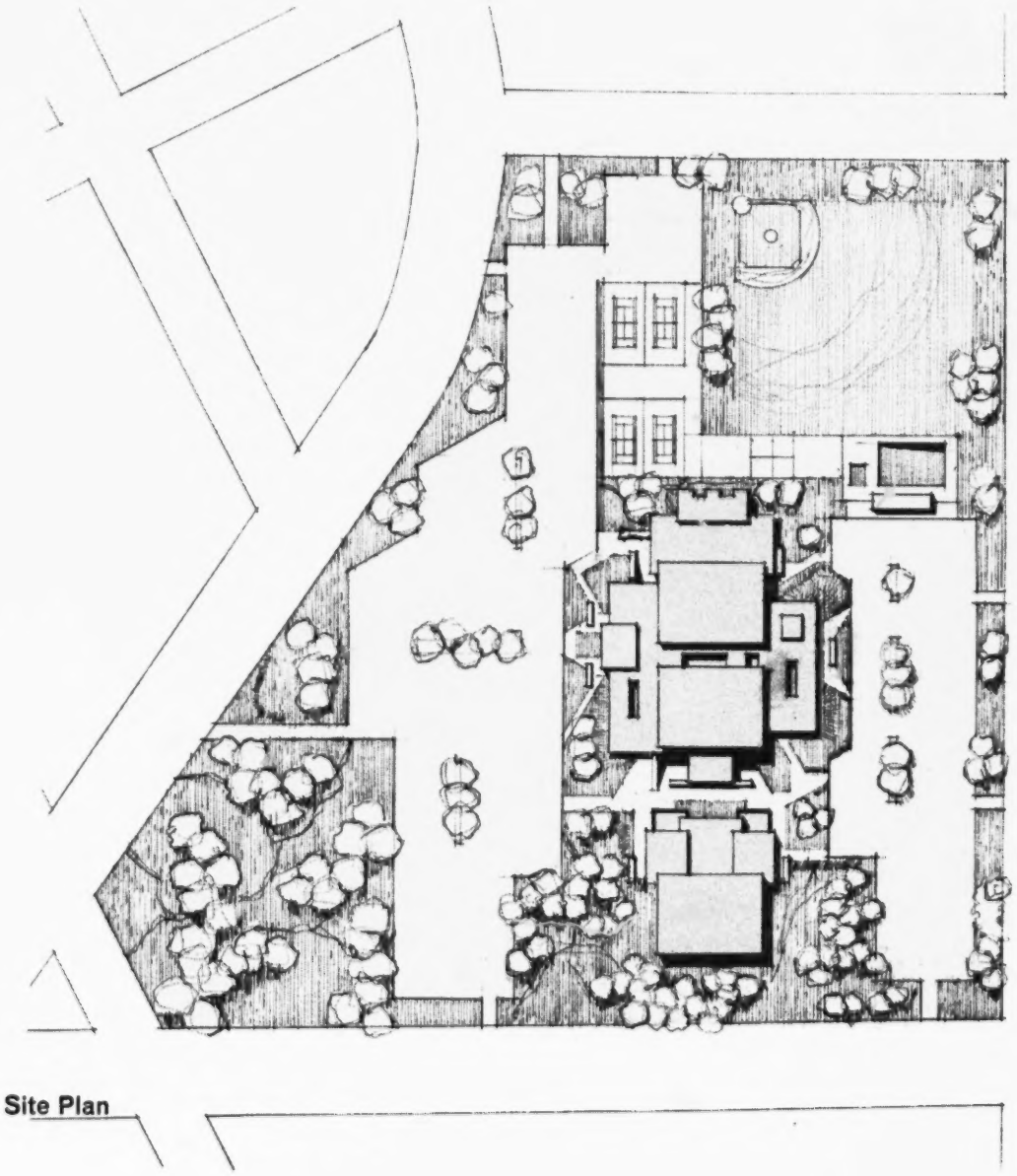
Donald W. Elliot, *Engineer, Fallout Shelter Analyst*

Jury Comment

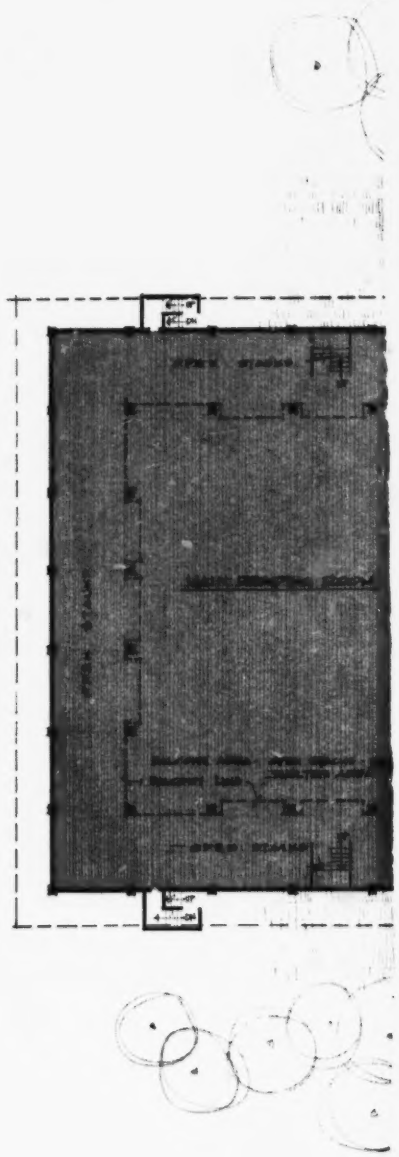
Entrance to the group of buildings is convenient and from any direction. The disposition of parking appears somewhat arbitrary. There is a desirable modesty in scale of the several elements making up the complex but at some sacrifice of the sense of unity and organization of the parts, as in the complete separation of the library from the other elements. Visually, the complex would relate well with the surrounding residential areas, and the materials and forms have been selected and used with sensitivity and discretion.

Analyst Comment

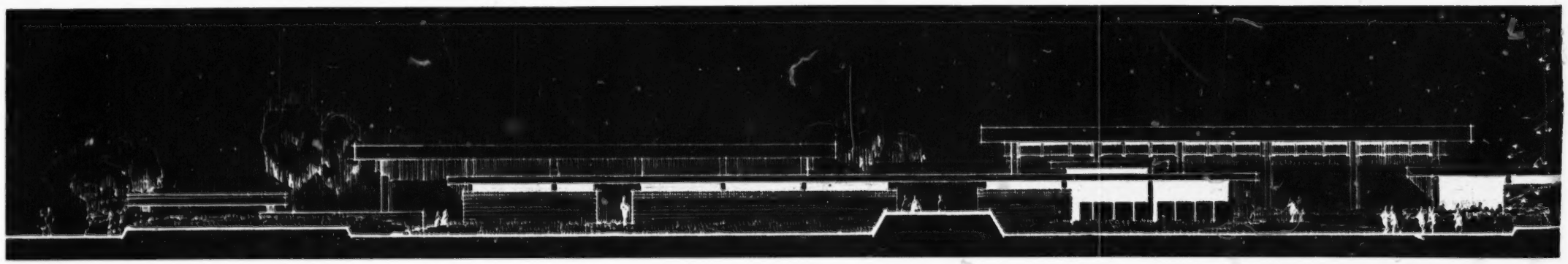
Shelter is provided in the main reading room—office areas, gymnasium and auditorium. Ground direct radiation was eliminated by lowering the building into the ground. Geometry shielding was used to baffle the entrances while retaining an open appearance.



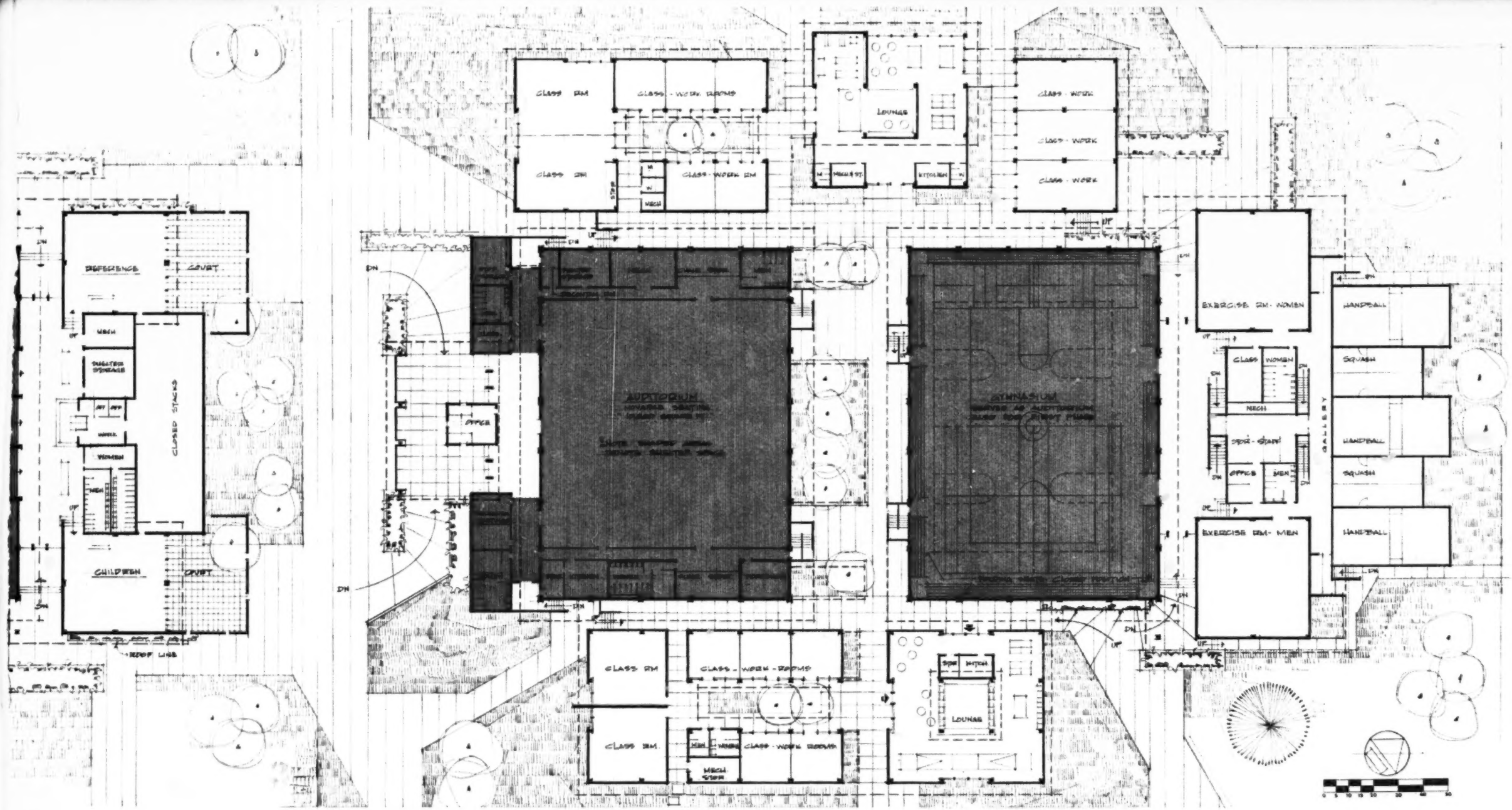
Site Plan

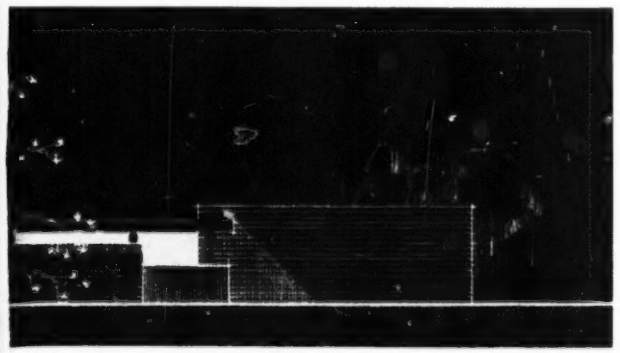


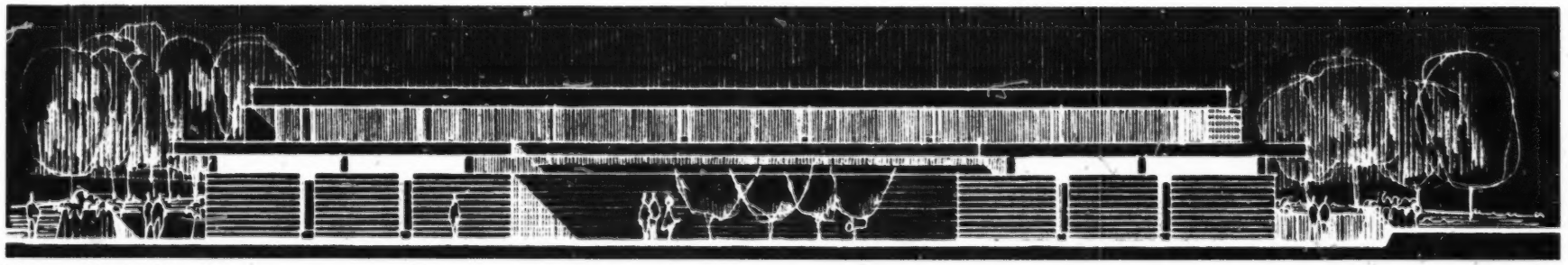
Plan



Elevation

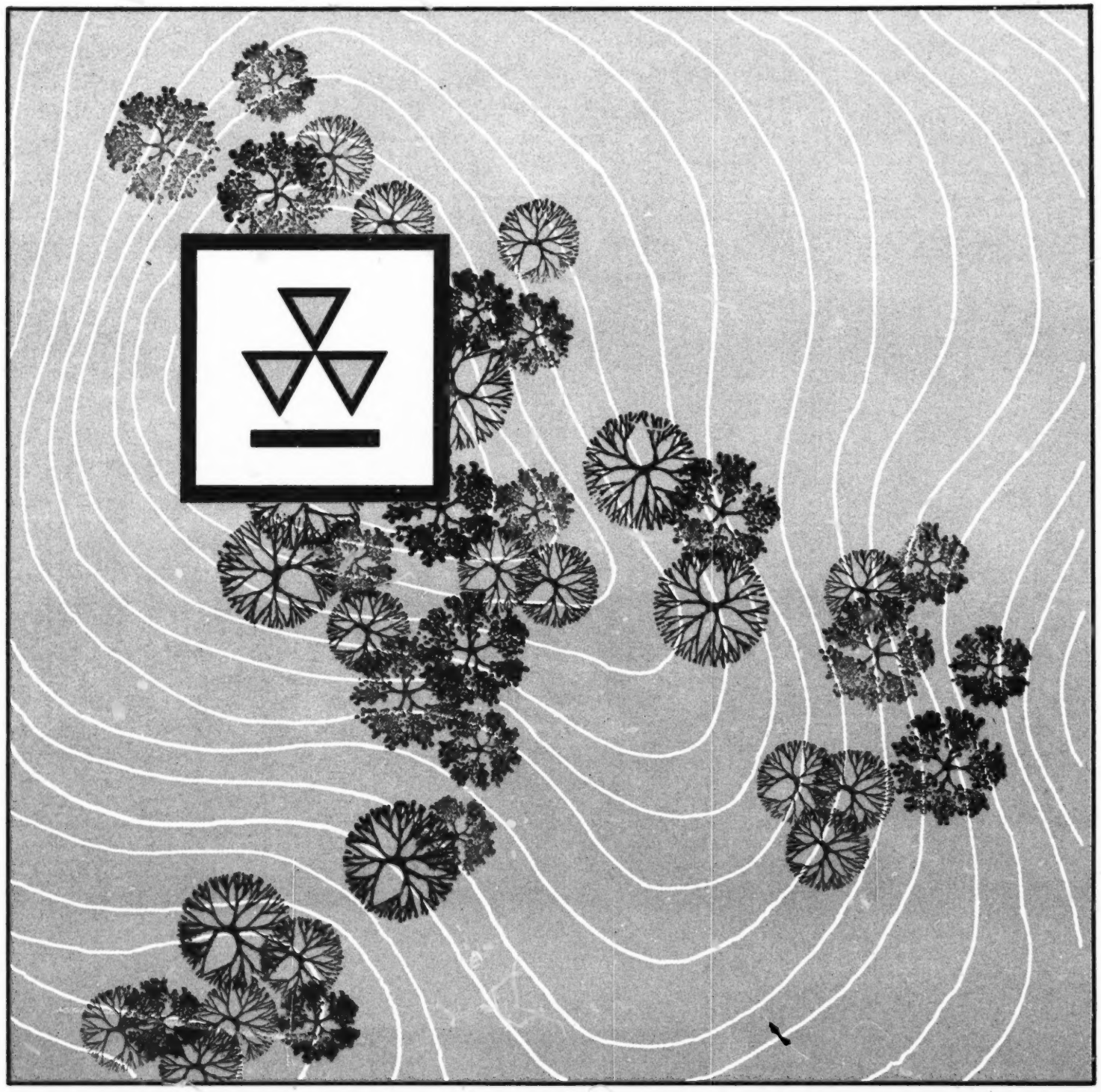






Library North Elevation

NOTE: the following is a reprint of the competition program as it was issued to competitors during December of 1965.



NATIONAL FALLOUT SHELTER DESIGN COMPETITION

COMMUNITY CENTER

The Department of Defense has contracted with The American Institute of Architects to conduct in its behalf a competition for the design of a community educational and recreational center incorporating dual purpose fallout shelter space. The aims of the competition are expressed in the following statement prepared by the Department of Defense.

OBJECTIVE AND SCOPE

This competition is the third in a series of architectural design competitions conducted by The American Institute of Architects for the Office of Civil Defense.

As in the first two competitions, the objective is to demonstrate that fallout shelters can be included as dual-use space in all building types at little or no added construction cost and without adversely affecting function or appearance. The results will be published and disseminated to architects, engineers, planners and others with a need-to-know. By seeing how easily shelter can be incorporated as dual-use space through the use of imaginative inovations, they will be stimulated to include shielding in their own designs.

Schools and shopping centers have been the subjects of the previous competitions. This competition will focus study and investigation on another important building type—the community center—designed to serve normal long range community needs and incorporating added emergency protection from fallout gamma radiation for the people it serves.

The now familiar black and yellow signs marking existing shelters are most numerous in the central core of large urban communities where the larger and generally heavier construction contributes inherent protective shielding. The smaller scale public and private buildings in suburban neighborhoods and the smaller urban communities have generally been found to provide insufficient shelter for the populations they serve. If the national goal of shelter for every man, woman and child, whenever and wherever needed, is to be met, much of the additional shelter must be incorporated in new construction as dual-use space.

Awards are offered to stimulate progress towards the national goal and to promote advancement and refinement in the field of shelter design. The designs should provide clarifying definition of the essential nature of fallout shelter as dual-use space. They should also be an important demonstration of ways to create this added community defense resource, with greatest economy, through thoughtful planning.

In selecting a community educational and recreational center as the subject for this design competition, the OCD was mindful of the goals of other national programs. Many of these emphasize education for both youth and adults, retraining for increased economic opportunity, recreation and physical fitness, the development of needed community facilities and improvements to total environment. It is hoped that the premiated entries will stimulate the creation of new facilities serving long range community needs and will provide emergency protection for the civilian population from one of the potential hazards of modern time—radioactive fallout from nuclear attack.

$55,000 in prizes!

AWARDS

The following prizes are provided:

1 National Grand Prize	@ $15,000	$15,000
7 Regional First Prizes	@ $4,000	$28,000
8 Regional Second Prizes	@ $1,000	$8,000
8 Regional Third Prizes	@ $500	$4,000
TOTAL CASH PRIZES		**$55,000**

Judgment will be conducted on a Regional basis with first, second and third place winners established for each of the eight Civil Defense Regions. The National Grand Prize of $15,000 will be awarded to one of the submissions placing first in regional competition. Regional first prize awards of $4,000 will be made to each of the remaining first place winners.

In addition, up to 20 Certificates of Merit will be awarded. Winners will be announced within 15 days of the judgment and cash prizes paid shortly thereafter.

The Jury will award the National Grand Prize and is authorized to award all prizes as listed above. However, the Jury has the right to withhold the awarding of any or all prizes in any Region if, in its judgment, the quality of the submissions received from the Region do not warrant such prizes.

OWNERSHIP

All entries shall become the property of the Office of Civil Defense, provided however, that entries not awarded monetary prizes will be used only for publicity or educational purposes. The competitors concerned will be identified in connection with reproduction of any entry by the Government. Credit will be given to all members of the design team with the registrant being listed first.

JURY

EDGARDO CONTINI, P.E.
Victor Gruen Associates
Beverly Hills, California

NATHANIEL C. CURTIS, FAIA
Curtis & Davis Architects
New Orleans, Louisiana

ALLEN CYWIN, P.E.
Assistant Commissioner for Operations and Engineering
Community Facilities Administration, HHFA
Department of Housing and Urban Development

MILO S. KETCHUM, P.E.
Ketchum, Konkel, Ryan & Fleming
Old Saybrook, Connecticut

CHARLES M. NES, JR., FAIA
Fisher, Nes, Campbell & Associates
Baltimore, Maryland
First Vice President, The American Institute of Architects

WALTER B. SANDERS, FAIA
Professor of Architecture
University of Michigan
Ann Arbor, Michigan
President, Association of Collegiate Schools of Architecture

NICHOLAS SATTERLEE, AIA
Nicholas Satterlee & Associates
Architects
Washington, D.C.

TECHNICAL ADVISER TO THE JURY
James E. Roembke, P.E.
Director
Architectural and Engineering Services Division
Department of Defense
Office of Civil Defense
Washington, D.C.

PROFESSIONAL ADVISER
A. Stanley McGaughan, AIA
McGaughan and Johnson, Architects
Washington, D.C.

The Jury shall have full and final power in the selection of all entries for awards. All entrants in this competition agree that they will make no claim against the Jury, any members thereof, the Professional Adviser, The American Institute of Architects or the Government on account of anything that may be done or omitted to be done, except in connection with the failure to deliver monetary prizes as awarded.

Mr. James E. Roembke, P.E., Director, Architectural and Engineering Services Division, Office of Civil Defense, has been designated as technical adviser to the Jury.

A. Stanley McGaughan, AIA, has been appointed as Professional Adviser and his address for this competition is 1341 New Hampshire Avenue, N.W., Washington, D.C., 20036.

EXAMINATION OF DESIGN AND AWARDS

The Professional Adviser will examine the designs to ascertain whether they comply with the mandatory standards. At the time of judging, those selected for consideration as winners will be carefully examined and computation made of the protection factors and shelter capacities to assure compliance with the design criteria stipulated in this program.

REPORT OF THE JURY

The Jury will make a report giving the order of selection and the pertinent reasons for their choices

ELIGIBILITY

Collaborative participation by architects and engineers, working as design teams, is a requirement because of the scope of this competition.

Design teams must include at least one qualified member from each of the two design disciplines. Such qualified members must be either registered architects or engineers licensed to practice in the United States or faculty members or graduates of accredited architectural or engineering schools. These include architectural schools currently accredited by the National Architectural Accrediting Board and engineering schools having curricula currently accredited by the Engineers Council for Professional Development. An architectural or engineering graduate to be eligible to register shall have received his baccalaureate degree in architecture or engineering from an architectural or engineering school which was at the time of his graduation qualified as indicated above.

Either the registrant or a member of the design team shall be a graduate of the Fallout Shelter Analysis Course sponsored by the Office of Civil Defense. Experience in previous competitions involving shelter design has demonstrated the importance of a knowledge of fallout shelter analysis to the achievement of economical dual-purpose shelter space. The latest edition of The National Directory of Architects and Engineers Qualified in Fallout Shelter Analysis will be sent to each registrant.

Teams must be registered with the Professional Adviser in the name of an *individual* who shall be either a registered architect or engineer or a faculty member or graduate. Each registrant shall show on his registration form his valid license number with an architectural or engineering registration board in one of the States, the District of Columbia, Puerto Rico, the Virgin Islands or the Panama Canal Zone, or shall show his affiliation with or degree from an accredited archiectural or engineering school.

Employees of Federal, State or local Offices of Civil Defense and their families and staff members of The American Institute of Architects and their families are not eligible to participate in this competition. The registrant must be a citizen of the United States.

COMMUNICATIONS (Mandatory)

No communications will be allowed in view of the size of the competition. All entrants must rest on their own judgment of the problem as stated.

RETURN OF DRAWINGS

No drawings will be returned. It is suggested that competitors keep copies if they so desire.

COMPLETENESS OF DRAWINGS

Architectural, structural, mechanical and electrical design shall be shown in sufficient detail to permit easy determination of economic feasibility, protection factor and shelter capacity. Detailed working drawings are not required.

Outline specifications or narrative shall be used to supplement the drawings and shall be clearly identified if enclosed in an envelope.

The limits of designated shelter areas shall be clearly indicated and material thicknesses shall be given either by scale, dimension or note, wherever such thicknesses are significant in computing the protection factor.

One sheet of the drawings (preferably a plan sheet) shall include a tabulation or space diagram showing:

1 The total gross floor area of the building or buildings of which the center is comprised.
2 The gross floor area for the recreational facility, the library, other educational facilities and other community use areas included in the center.
3 The interior floor area of the fallout shelter or shelters.

All areas shall be expressed in square feet. Gross floor area shall be measured to the exterior face of exterior walls and to the center line of dividing walls or partitions.

REQUIRED DRAWINGS (Mandatory)

The following drawings are required:

1 A plot plan—showing arrangement of buildings, parking areas and other improvements and the relationship of the center to the surrounding community—Scale 1" = 100'
2 All floor plans—Scale ⅛" = 1'-0"
3 Principal Elevations—at least two—Scale ⅛" = 1'-0" (Where more than one building is used at least two elevations for each building are required.)
4 An exterior perspective—any suitable scale
5 An interior perspective of shelter areas—any suitable scale
6 Principal sections showing structure—at least one each major direction—Scale ⅛" = 1'-0"
7 Other drawings as may be necessary to illustrate fallout protection, including mechanical and electrical features. For this purpose schematic sketches, amplified as necessary by written text, are preferred.

Drawings shall be on white translucent paper, measuring 20 inches vertically and 30 inches horizontally. A single border line may be used if desired. Drawings shall be in black and white with attention given to suitability for reproduction. Drawings shall not be rolled but shall be kept flat to facilitate review and display.

Models will not be permitted.

Outline specifications or narrative or both, of not more than 500 words, typewritten and double spaced, on one side only of plain 8½" by 11" pages shall accompany the entry.

ANONYMITY OF DRAWINGS (Mandatory)

The drawings to be submitted shall bear no name or mark which could serve as identification, nor shall any competitor directly or indirectly reveal the identity of his design, or hold communication regarding the competition with the Office of Civil Defense, The American Institute of Architects, the Jury or the Professional Adviser. It is understood that in submitting a design, each competitor thereby affirms that he has complied with the foregoing provisions in regard to anonymity, and agrees that any violation of them renders null and void any consideration in this competition.

With each set of drawings must be enclosed a plain, opaque, sealed envelope which shall bear no superscription or mark of any kind other than O.C.D. Region 1 (to 8) as the case may be, which number shall be the region of the Office of Civil Defense in which the registrant lives, and for which the center is designed.

The following information shall be enclosed in the envelope:

1 Names, addresses and professional or school affiliation of the registrant and other members of the design team. The fallout shelter analyst shall be designated in this listing with his certificate number shown.

2 Name(s) of individual(s) to whom any award check is to be made payable and address to which check is to be mailed.

3 An 8½" x 11" tracing of one distinctive element of the plan, with the location of the element noted to facilitate matching for positive identification.

Caution: Do *not* enclose narrative in the identification envelope.

Entries and envelopes will be numbered upon receipt, with envelopes remaining unopened until after the judging when they will be opened in the presence of the Jury and a representative of the O.C.D.

The following identification shall appear on the drawings:

1 The region number shall appear also on the first sheet of drawings in the upper right hand corner.

2 The sheet number and the total number of sheets in the set shall be shown in the lower right hand corner on each sheet, i.e., Sheet 1 of 5 Sheets.

DELIVERY OF DRAWINGS (Mandatory)

Drawings shall be addressed to the Professional Adviser, National Fallout Shelter Design Competition—Community Center, 1341 New Hampshire Avenue, N. W., Washington, D. C., 20036. All entries shall be sent by registered mail prior to midnight 1 May, 1966. Receipts shall be forwarded to the Professional Adviser under separate cover as evidence of mailing.

SCHEDULE OF DATES

Announcement, 22 November 1965
Program Mailing Begins on or before, 15 December 1965
Registration Ends on, 1 March 1966
Competition Ends on, 1 May 1966
Judging Completed by, 1 June 1966
Awards Announced by, 15 June 1966

SITE

The total site of approximately 29 acres shown by the vicinity map herein has been reserved for educational, recreational and related community uses. Each design team shall select a site or sites from within this area for development as a community educational and recreational center. The balance of the area shall be assumed to be utilized for park and outdoor recreational purposes

The topography of the site is not shown but is left to the discretion of the designer. Each design team shall develop hypothetical topography natural to the geographical area in which the center is located.

The site for this center may be assumed to be located in one of the suburban communities of a large metropolitan area or in a relatively small independent urban community, as the designer elects.

The site shall be considered to be located within the OCD Region in which the registrant resides. A short paragraph shall be included in the narrative or noted on the drawings to indicate the subsurface conditions, soil types encountered and water level for the hypothetical site. This shall be indigenous to site selected. In judging, the Jury will consider the solution with respect to the particular site and the climatic conditions prevailing in the area.

Problem

The problem is to design a community educational and recreational center incorporating fallout shelter as dual-purpose space.

The center shall include a public library, educational classrooms and shops, community meeting rooms, facilities for both indoor and outdoor athletics and a variety of recreational facilities.

The center shall have a gross floor area of from 75,000 to 135,000 square feet and shall provide a parking area equivalent to not less than 3 times the gross floor area.

The total facility shall be designed to permit its construction in two or more increments as the availability of municipal construction budgets may dictate. The division of the project into separate increments shall be clearly indicated on the drawings.

The library shall have a gross floor area of 25,000 to 35,000 square feet and may be considered as either a branch library associated with a large metropolitan system or as an independent unit.

At least four classrooms (approximately 900 sq. ft. each) shall be provided. These may serve both organized instructional purposes and as meeting rooms for smaller groups.

Either a civic auditorium with fixed seating or an all-purpose room using movable seating shall be included to provide for gatherings of from 750 to 1200 people.

Workshops, laboratories, studios and similar facilities shall be provided to meet the needs of both youth and adult education programs involving the development of needed skills as well as recreational programs relating to leisure time activities. Appropriate lounge space and game rooms shall also be included.

Athletic facilities shall include but are not limited to indoor courts for squash and handball, exercise rooms and toilet and locker rooms to serve both indoor and outdoor activities. The inclusion of a gymnasium and swimming pool is left to the discretion of the designer. Outdoor facilities may include tennis and badminton courts, and facilities for other sports suited to the climate and practices of the area. Athletic fields including facilities for such team sports as softball, baseball and football may be included within the limits of the total site at the option of the designer. In any case, noisy outdoor activities shall be properly separated from the quieter educational and recreational functions.

Administrative office space, necessary public toilets and all needed facilities for operation and maintenance of the center shall be provided as appropriate to the total plan.

The fallout shelter area shall be designed as dual-purpose space serving the described normal peace-time functions and providing protection from fallout gamma radiation during emergency periods.

The national shelter survey has discovered and marked existing public fallout shelter spaces throughout the country and has further identified spaces that could provide shelter with minor architectural and mechanical improvements. A summary of the findings of the survey for the area surrounding the proposed community center is as follows:

	NUMBER OF PEOPLE
Peak Population (night time)	19,300
Capacity of existing Community Shelter Space	1,300
Capacity of Potential Community Shelter Space (i.e., space available if minor improvements are completed)	2,200
Population not accommodated by either existing or potential Community Shelter Space	15,800

The objective is to provide as much new shelter space as is practicable and economically feasible in the proposed community center.

The shelter or shelters shall accommodate a total of at least 1,500 persons (preferably more), and provide a protection factor (PF) of not less than 40 determined by methods currently used by the Office of Civil Defense in fallout shelter analysis.

Submissions will be judged on the quality of the total design, on excellency of planning, on both functional and aesthetic features of the recreational and educational facilities provided, on suitability and adequacy of the fallout shelter and on validity and economy of the design for dual-purpose space.

Economy of construction including considerations of maintenance and operating costs is considered essential. For this reason and because of the need for determining the protection factor, materials must be identified.

Design criteria for determination of the protection factor and shelter occupancy standards are as supplied by the Office of Civil Defense, Department of Defense and stated in the following section.

Shelter Design Criteria

1 RADIATION SHIELDING

a A fallout shelter is a structure, room or space which protects its occupants from fallout gamma radiation and provides a protection factor (PF) of at least 40. This factor is used to express the relation between the amount of fallout gamma radiation that would be received by an unprotected person compared to the amount he would receive in the shelter. For example, an occupant of a shelter with a PF of 40 would be exposed to a dose rate 1/40 or (2½%) of the rate to which he would be exposed if his location were unprotected.

b Computations shall be made by the methods established in OCD publication, "Shelter Design and Analysis—Volume I Fallout Protection." This has been furnished to all qualified Fallout Shelter Analysts by OCD.

c In the calculation of the protection factor, the radiation dose contribution to the shelter occupants coming from the entranceways, ventilation ducts or other openings in the shelter's barriers shall be considered.

d Entranceways shall be properly designed to prevent the infiltration of fallout particles and to reduce the fallout gamma radiation hazard through the use of principles of geometry and/or barrier shielding.

2 SPACE AND VENTILATION REQUIREMENTS

a Provision shall be made to prevent the build-up of vitiated air in shelter to a level hazardous to its occupants during the design period of occupancy.

b At least 10 square feet of shelter area per person shall be provided.

c At least 65 cubic feet of space per person shall be provided.

d If the shelter capacity is based on minimum space requirements, then at least 3 cubic feet of fresh air per minute per person are required.

e When ventilation is limited, the following table can be used for determining the relation of space requirements to ventilation:

Rate of air change (minutes)[1]	Volume of space required per person (Cu. Ft.)[2]
1,000 or more	500
600	450
400	400
200	300
100	200
60	150
35	100
22	65

[1]Computed at the ratio: $\frac{\text{Net Volume of Space (cu. ft.)}}{\text{Fresh air supply (cfm)}}$

[2]Shelter capacity or occupancy time may be limited by the volume of the room and not by its area. This is particularly true if mechanical ventilation is inadequate. In many cases, however, interior stairwells, shafts, and ducts would create enough natural ventilation to permit a continuous occupancy for at least three (3) days.

f No filters are required on mechanical ventilation systems other than those necessary for the normal daily use of the space.

3 EGRESS

At least one unit of access and egress width should be provided for every 200 people (a unit width is 22 inches, the space required for free travel of one aisle of persons). In no case shall the width be less than 24 inches; nor shall there be less than two widely separated means of egress from each shelter.

4 SERVICES

a General

Provisions will be made for the storage of basic shelter supplies by allotting one and one-half cubic feet per person. Community shelters meeting Federal Criteria are now being stocked with:

(1) Water containers—Enough to provide each person with 14 quarts of water.

(2) Food—Survival biscuits and crackers, bulgur wafers and carbohydrates supplement packed in weather resistant fiber board cases containing either two five gallon cans or six two and one-half gallon cans.

(3) Medical care kits.

(4) Sanitation kits which include toilet tissue, sanitary napkins, waterless hand cleaner, toilet seat and commode chemicals. Empty water containers convert to commodes.

(5) Radiation detection instruments.

The live load attributable to stacked water drums and other supplies must be considered.

b Alternative Assumptions

(1) Water Supply—Where trapped water in piping system and storage tanks will furnish part or all of the water requirement, storage for shelter supplies may be reduced accordingly but not to less than .6 cu. ft. per person.

(2) Sanitation—Where water drums are eliminated, other provision shall be made for disposal of human waste. Toilets may be provided on the basis of one per 50 occupants. In lieu of 4 a(4) above, other austere provisions based on economic considerations may be made for the disposal of garbage, trash and human waste. Fifty percent of the toilets may be outside the shelter area, in other parts of the same building, provided they are readily accessible without hazardous exposure to fallout gamma radiation.

(3) Electric Power—It is assumed that normal electrical power will be available. Therefore, emergency generators are not required. No special lighting levels are required in fallout shelters.

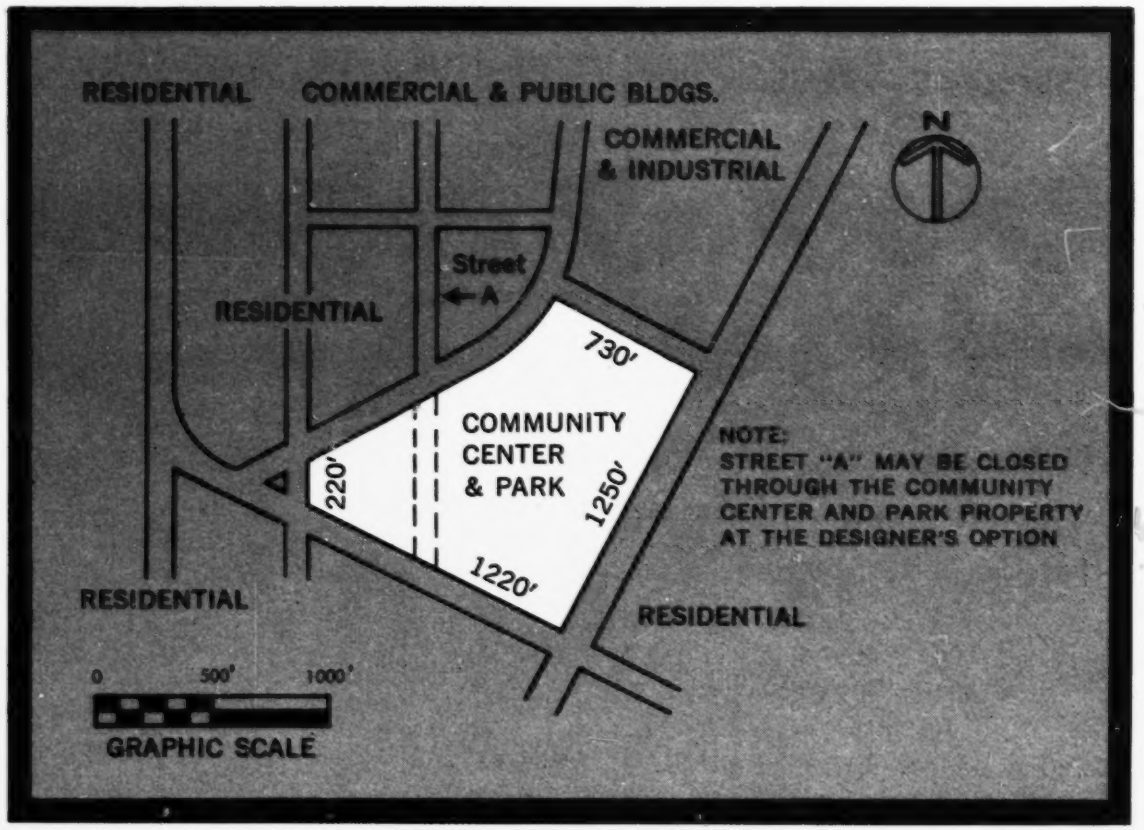
The following levels are deemed adequate for emergency occupancies:

Sleeping Areas—2 ft. candles at floor level

Activity Areas—5 ft. candles at floor level

Administrative and Medical Areas—20 ft. candles at desk level.

VICINITY MAP



O.C.D. REGIONS

1
Me., N.H., Vt., Mass., Conn., R.I., N.Y., N.J., P.R., V.I.

2
Pa., Ohio, Ky., VA., W.Va., Md., Del., D.C.

3
Tenn., N.C., S.C., Ga., Ala., Miss., Fla.

4
Minn., Wis., Mich., Ill., Ind.

5
N.M., Okla., Tex., Ark., La.

6
N.D., S.D., Wyo., Nebr., Colo., Kan., Iowa, Mo.

7
Calif., Nev., Utah, Ariz., Hawaii

8
Wash., Mont., Oreg., Id., Alas.

NOTE: For purposes of this competition, the Panama Canal Zone will be considered as part of Region 5.

For distribution to:
State and Local CD Directors
OCD Regions, Staff College

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